PROPOSED TEXT
FOR
PROPOSED BUILDING STANDARDS
OF THE
DEPARTMENT OF CONSUMER AFFAIRS
Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation

REGARDING PROPOSED CHANGES TO
STANDARD FOR INSULATING MATERIALS
CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 12 CHAPTER 12-13
(See Part 6, Title 24, C.C.R.)

LEGEND FOR PROPOSED TEXT:
1. New or modified language is underlined.
2. Repealed text appears in ~~strikeout~~.

Amend title 24, California Code of Regulations, Part 12, Chapter 12-13, Article 3 as follows:

A. Article 3. Standards for Insulating Material

Application and Scope

Sec. 12-13-1551.

(a) This article establishes standards governing the quality of insulation materials ~~sold within the state after September 22, 1981,~~ including those properties which affect the safety and ~~thermal~~ performance of insulation materials during application and in their intended use. ~~intended.~~

~~(b) The provisions of this article shall apply only to the following types of insulating material:~~

1. ~~Aluminum foil (reflective foil);~~
2. ~~Cellular glass (board form);~~
3. ~~Cellulose fiber (loose fill and spray applied);~~
4. ~~Mineral aggregate (board form);~~
5. ~~Mineral fiber (blankets, board form, loose fill);~~
6. ~~Perlite (loose fill);~~
7. ~~Polystyrene (board form, molded and extruded);~~
8. ~~Polyurethane (board form and field applied);~~
9. ~~Polyisocyanurate (board form and field applied);~~
10. ~~Urea formaldehyde foam (field applies);~~
11. ~~Vermiculite (loose fill).~~

(b~~c~~) The provisions of this article shall apply to ~~the sale of~~ insulating material sold or installed within ~~the state~~ California. The provisions of this article shall not apply to insulating material manufactured in California, but sold at wholesale for delivery outside the state, nor to insulating material manufactured outside California and sold wholesale in California for final retail sale outside the state. For the purpose of this article, the sale of a building or an appliance which contains installed insulating material is not considered the sale of the insulating material.

(c~~d~~) ~~Any type of insulating material not listed in subsection (b) may be sold within California notwithstanding any other provision of this article~~. Insulating material shall not be sold in California unless it is certified by the Bureau . For any insulating material not specifically identified in this article, where challenges of testing values have been submitted to the Bureau or are initiated by the Bureau, the Bureau, in consultation with the California Energy Commission, may certify the insulating material by applying testing and rating provisions similar to those defined in section 12-13-1553 as it deems most appropriate on a case by case basis.

(d) All insulating material subject to this article shall also meet California's Energy Efficiency Standards for Residential and Nonresidential Buildings, Title 24, Part 6, and Appliance Efficiency Regulations, Title 20, California Code of Regulations.

Authority cited: Sections ~~25920 and 25922, Public Resources Code~~ 19034 and 19164, Business and Professions Code.
Reference: Sections ~~25910, 25920, 25921~~ 19070, 19073, 19164 and ~~25922, Public Resources Code~~ 19165 Business and Professions Code.

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II. Definitions

Sec. 12-13-1552. ~~For purposes of this article, the following definitions shall apply:~~Terms, phrases, words and their derivatives shall be defined as specified in this section. Terms, phrases, words and their derivatives not found in Section 12-13-1552 shall be defined as specified in Title 24, Part 2, Chapter 2 of the California Code of Regulations. Unless the context requires otherwise, any undefined term shall have its ordinary meaning.

"Aerogel" means a porous structure characterized by continuous, interconnected pores that have an average pore size below the mean free path of air molecules at standard atmospheric pressure and temperature.

~~(a)~~**"Approved laboratory"** means any testing facility including a facility owned or operated by a manufacturer, which has been approved pursuant to Section 12-13-1554 of this article.

~~(b)"ANSI" means the American National Standards Institute.~~

~~(c)~~**"ASTM"** means the American Society for Testing and Materials International.

"ASHRAE" means American Society of Heating, Refrigerating and Air-Conditioning Engineers.

"Blackbody" means the ideal, perfect emitter and absorber of thermal radiation. It emits radiant energy at each wavelength at the maximum rate possible as a consequence of its temperature, and absorbs all incident radiance.

"Batt" or "batting" means blanket insulation manufactured to dimensions as required by a specific application.

"Blanket" means a flexible insulation product, supplied rolled or flat.

"Block insulation" means rigid insulation preformed into rectangular units.

"Board insulation" means semi-rigid insulation preformed into rectangular units having a degree of suppleness particularly related to their geometrical dimensions.

"Bureau" means the Bureau of Electronic and Appliance Repair, Home Furnishings, and Thermal Insulation.

"Building insulation" means mass insulation materials used in walls, ceilings, roofs and floors of buildings.

(~~d~~)**"Building materials"** means materials used in walls, ceilings, roofs and floors of buildings.

"Calcium silicate" means insulation composed principally of hydrous calcium silicate, and which usually contains reinforcing fibers.

"Calcium silicate board" means an insulation board composed of hydrated calcium silicate with natural or manmade fibers or fillers, or a combination thereof.

"CBC" means the California Building Code.

"CEC CODES" means the California Electric Code.

"Cellular glass" means insulation composed of glass processed to form rigid foam having a predominantly closed-cell structure.

"Cellular glass board" means an insulation board composed of glass which has been foamed or cellulated under molten conditions, annealed and set to form a rigid material with hermetically sealed cells.

"Cellular polyolefin" means a cellular plastic composed primarily of olefin material, processed to form a flexible foam with a closed cell construction.

"Cellulosic fiber" means insulation composed principally of cellulose fibers usually derived from paper, paperboard stock, or wood, with or without binders.

"Cement bonded wood fiber" means a composite material consisting of cellulosic fiber or wood waste combined with Portland cement.

"Ceramic fiber batting" means a batting whose basic material is a lightweight, efficient high temperature alumina-silica insulation that offers stability at elevated temperatures with high resistance to thermal shock

"Ceramic fiber board" means an insulation board composed of lightweight, efficient high temperature alumina-silica

DRAFT

insulation that offers stability at elevated temperatures with high resistance to thermal shock.

"Combustible dust" means finely divided solid material that is 420 microns or less in diameter and which, when dispersed in air in the proper proportions, could be ignited by a flame, spark or other source of ignition. Combustible dust will pass through a U.S. No. 40 standard sieve.

"Cotton batting" means a batting whose basic material is an unfaced batt insulation consisting of a blend of recycled-cotton and polyester fibers treated to resist flame and smoke development and inhibit mold, mildew, bacteria and fungi growth.

"CMC" means the California Mechanical Code.

"Design density" means the density for loose fill cellulose insulation determined in accordance with ASTM C 739-11 Section 8.

"Duct board" means a rigid or semi-rigid board which has a composition that permits precise cutting and abutment to create tight fitting corners. Duct board typically has an aluminum foiled facings and has flame retardant as well as thermal and acoustical insulating properties.

"Duct liner" means a liner that is used either as an air barrier inside of a flex-duct or is used as a thermal and acoustical insulation on the inside of sheet metal ductwork.

"Duct system" means a system that provides either collectively or individually heating, ventilating, or cooling within or associated with conditioned spaces in a building. Components include all air-distribution system ducts and plenums.

"Duct wrap" means a flexible, resilient blanket which is applied to the exterior of sheet metal ducts. It may be easily cut and fitted to achieve a neat, thermally effective exterior insulation blanket over rectangular, round, oval or irregularly shaped duct surfaces.

"Elastomeric sheet" means a cellular elastomeric foam composed of a closed-cell foam made of natural or synthetic rubber, or a mixture of the two, and containing other polymers, other chemicals, or both, which is permitted to be modified by organic or inorganic additives. These foams have properties similar to those of vulcanized rubber, namely, (1) the ability to be converted from a thermoplastic to a thermosetting state by cross-linking (vulcanization) and (2) the ability to recover substantially its original shape when strained or elongated.

~~(e)~~**"Exposed application"** means any interior application of the product in which it is not used in a construction assembly imposing a material which meets the requirements of Chapter 8 of the ~~*California Building Code*~~ CBC in substantial contact with the facing or membrane surface.

"Facing" means a protective or decorative (or both) surface applied as the outermost layer of an insulation system.

"Field applied" means a blown or spray applied insulation product applied at the final work site.

"Flexible air duct" means an air duct typically consisting of the following; (A) a flexible plastic over a metal wire coil to make a round flexible duct; (B) a layer of fiberglass insulation that covers the duct, and (C) a thin plastic layer that protects the insulation.

"Framed assembly" means one or more building components added in layers within or onto standard wood or metal framing members to create a finished wall, roof/ceiling, or floor.

"Framing percent" means the amount of surface area (expressed as percentage) of wood or metal framing making up a typical exterior wall, roof/ceiling, or floor assembly ~~for testing~~.

"Health hazard" means a classification of a chemical for which there is statistically significant evidence that acute or chronic health effects are capable of occurring in exposed persons. The term "health hazard" includes chemicals that are toxic or highly toxic and corrosive.

~~(f)~~**"Installed design density"** means the proven density for loose fill insulation other than cellulose which has been determined by the manufacturer to constitute the density whereby settlement of no more than 2 percent shall occur over the first three years, or no more than 4 percent over the first 15 years of installation.

"Insulated concrete forms" means a system of formwork for concrete that stays in place as permanent building insulation made up of block or board insulation of polystyrene, polyurethane, cement bonded wood fiber, or glass fiber.

"Insulated panels" means a construction that uses:

a) Liquid polyurethane or polyisocyanurate applied between metal or plastic skins in individual molds;

DRAFT

b) Rigid foamed polystyrene sheets to which metal skins are adhered; or

c) Rigid foamed polyisocyanurate sheets to which metal skins are adhered.

~~(g)~~**"Insulating material", "insulation material"** or **"insulation"** means those materials defined in Section 19019 of the Business and Professions Code and includes low emitting materials. ~~any material listed in Section 1551(b) of this article and placed within or contiguous to a wall, ceiling, roof or floor of a room or building, or contiguous to the surface of any appliance or its intake or outtake mechanism, for the purpose of reducing heat transfer or reducing adverse temperature fluctuations of the building room or appliance.~~

"Insulation system" means an entire assembly of individual components making up a wall, ceiling, roof, or floor for the purpose of reducing heat transfer or reducing adverse temperature fluctuations of the building. The overall heat transfer is expressed as U-FACTOR.

"ISO" means the International Organization for Standardization.

"Loose fill cellulose" means loose fill insulation for which the basic material consists of virgin or recycled wood-based cellulosic fiber that may be made from related paper or paperboard stock.

"Loose fill mineral fiber (rock, slag, glass)" means loose fill insulation made from mineral substances such as rock, slag or glass processed from a molten state into fibrous form.

"Loose fill perlite" means loose fill insulation produced by the expanding of natural perlite or by heating.

"Loose fill vermiculite" means loose fill insulation produced by the expanding or exfoliating of natural vermiculate or by grading and heating.

"Loose fill wool" means loose fill insulation made from sheep's wool.

"Loose fill polyester" means polyester loose fill insulation made from 100% recycled polyester.

~~(h)~~**"Manufacturer"** means any person or entity that ~~who either:~~ meets the definition for "Insulation manufacturer" contained in Section 19022 of the Business and Professions Code.

~~1. Produces insulating material in the final composition either for use in the form sold or to be further dimensionally modified; or~~

~~2. In the case of polyurethane, polyisocyanurate and urea formaldehyde foam formed at the installation site, produces the primary components of the material.~~

~~"Manufacturer" shall not include any building contractor or any other person whose sole activity is to install insulation at the installation site.~~

"Mass insulation" means insulating materials that slow conductive and convection heat transfer into or out of a building, including, but not limited to, cellulose, fiberglass, rock wool, polystyrene, urethane foam, wool and vermiculite.

"Material R-value" means a R-value associated with a material.

"Melamine foam" means a low-density, semi-rigid, open-cell foam made from a melamine-formaldehyde or aldehyde polymer.

"Mineral aggregate board" means an insulation board that is mineral in nature, crushed, dried, and graded to the proper particle size and expanded by the application of heat to form a spherical, cellular type of aggregate.

"Mineral fiber (rock, slag, glass)" means fibers made from mineral substances such as rock, slag or glass processed from a molten state into fibrous form.

"Mineral fiber board (rock, slag, glass)" means an insulation board that is made from mineral substances such as rock, slag or glass processed from a molten state into a fibrous form.

"Mutual recognition arrangement (MRA)" is an agreement between the National Voluntary Laboratory Accreditation Program (NVLAP) and the International Laboratory Accreditation Cooperation (ILAC) and the Asia Pacific Laboratory Accreditation Cooperation (APLAC) and the InterAmerican Accreditation Cooperation (IAAC) to allow the acceptance of calibration and/or test results within the respective scopes of accreditation for laboratories accredited by any of the MRA signatory partners.

"Neoprene foam" means synthetic rubber foam produced by polymerization of chloroprene.

"Other insulation" means insulation not specifically covered by this section.

DRAFT

"Phenolic board" means an insulation board made from a rigid cellular foam insulation material with a substantially closed cell structure, whose polymer structure is made primarily from the poly-condensation of phenol, its homologues and/or derivatives with aldehydes and ketones.

"Polyester batting" means unfaced batt insulation consisting of polyester fibers that may be treated to resist flame and smoke development and inhibit mold, mildew, bacteria and fungi growth.

"Polyimide board" means an insulation board that is a cellular product in which the bonds formed between monomers during polymerization are imide or amide bonds.

"Polyurethane or Polyisocyanurate foam" means foam insulation based on the reaction of diphenylmethane diisocyanate (MDI) with a polyol resin.

"Polyurethane board" means an insulation board the manufacture of which shall be based on the reaction of MDI with a polyol resin, and includes laminated composite boards.

"Polyisocyanurate block or board" means an insulation board the manufacture of which shall be based on the reaction of MDI with itself and with a polyol resin.

"Polystyrene board" means an insulation board formed by the expansion of polystyrene resin beads by molding the insulation board resulting in expanded polystyrene foam (EPS boards), or formed by the expansion of polystyrene resin by an extrusion process resulting in a closed, multicellular structured board (extruded polystyrene XPS or XPS).

~~(i)~~**"Quality assurance program"** ~~(Reserved)~~ means a system of procedures as defined in Section 19021 of the Business and Professions Code.

"**Radiant barrier"** means a highly reflective, low emitting material with an emissivity of 0.05 or less installed at the underside surface of the roof deck and the inside surface of gable ends or other exterior vertical surfaces in attics to reduce solar heat gain into the attic.

~~(j)~~**"Recommended wall density"** means the density used for pressure fill retrofit wall applications to prevent settling.

"Reflective insulation" means thermal insulation consisting of one or more low emittance surfaces, bounding one or more enclosed air spaces.

~~(k)~~**"Representative sample"** means a sample of insulating material with the same characteristics (other than thickness) and using the same facing imposed on the insulating material manufactured for final use.

~~(l)~~**"Representative thickness"** means a thickness of insulating material at which the change in thermal performance per inch will vary no more than plus or minus 2 percent with increases in thickness.

"R-value" means a measure of thermal resistance of material or composite materials as defined in Section 19020 of the Business and Professions Code.

"Specific heat capacity" means the quantity of heat that must be added to a unit mass of a material to increase its temperature by one degree. Typical units are Btu/ºF-lb.

"Spray applied cellulose" means an insulation material consisting of virgin or recycled wood-based cellulosic fiber that may be made from related paper or paperboard stock, excluding contaminated materials and extraneous foreign materials such as metals and glass which may reasonably be expected to be retained in the finished product. Chemicals may be introduced to improve flame resistance, processing, adhesive and cohesive qualities, and handling characteristics.

"Spray applied foam" means insulation based on the reaction of an organic polyisocyanate with a polyol resin.

"Spray applied mineral fiber" means a light density insulation material composed principally of fibers manufactured from rock, slag or glass with or without binders.

"Spray polyurethane foam" means insulation based on the reaction of an organic polyisocyanate (A side) with a polyol resin (B side), the sides of which are mixed and sprayed directly to the substrate to be insulated (two component spray insulation) or pre-mixed and supplied as a one component system prior to being spray applied to the substrate to be insulated.

"Structurally insulated panels (SIPS)" means a construction system that consists of block or board insulation, or spray applied ~~rigid~~ foam insulation sandwiched between two layers of plywood or oriented strand board (OSB).

"Structural insulated sheathing (SIS)" means a construction system that consists of rigid foam insulation faced on one side with a material that provides bracing or other lateral structural support. The facing may be organic or inorganic material.

DRAFT

"System R-value" means a R-value associated with a system or construction of materials.

~~(m)~~**"TAPPI"** means the Technical Association of Pulp and Paper Industry.

"Thermal conductance (C-Value)" means a measure of the rate at which heat energy flows through a surface.

"Thermal conductivity (k-Value)" means the quantity of heat that will flow through a unit area of the material per hour when the temperature difference through the material is one degree.

"Thermal emittance" means the ratio of the radiant heat flux emitted by a sample to that emitted by a blackbody radiator at the same temperature.

~~(n)~~**"Thermal performance"** means the tested thermal conductivity, thermal conductance, U-factor, design density or thermal resistance (~~R~~R-value), as appropriate, of an insulating material.

"Thermal resistance (R-value)" means the resistance of a material or building component to the passage of heat in (hr-ft.^{2}-^{o}F)/Btu.

"TITLE 24" means all of the building standards and associated administrative regulations published in Title 24 of the California Code of Regulations.

"U-FACTOR" is the overall coefficient of thermal transmittance of a construction assembly, in Btu/(hr x ft^2 x ^{o}F), including air film resistance at both surfaces.

~~(o)~~**"Urea formaldehyde foam"** means a cellular plastic insulation material generated in a continuous stream by mixing the components which are a urea formaldehyde resin, air and a foaming agent.

"Vacuum panel" means a vacuum insulation panel (VIP) consisting of a special core panel enclosed in an air-tight envelope, to which a vacuum is applied. The core panel could be made of various open or closed-cell materials, such as polystyrene, polyurethane, and a combination of silica, titania and carbon. The core is wrapped in a metallic or mylar foil, and the vacuum applied. The metallic film is sealed to maintain the vacuum for a long period of time.

"Water vapor retarder (barrier)" means a material that has a permeance of one perm or less and that provides resistance to the transmission of water vapor.

"Wool batting" means sheep wool fibers garneted into blanket or batt form, and may contain polyester fiber and/or a latex coating for strength and to resist vermin.

Authority cited: Section~~s 25920 and 25922, Public Resources Code~~ 19164, Business and Professions Code.
Reference: Sections ~~25915 (a), 25920, 25921 and 25922, Public Resources Code~~ 19018,19019,19020,19021, 19022, 19034, 19164, and 19165, Business and Professions Code.

Referenced Tests Section
Sec. 12-13-1552.10 The testing procedures specified in this article are listed in this section.

"ASTM C 167-09" means the American Society for Testing and Materials International document entitled "Standard Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations."

"ASTM C 177-10" means the American Society for Testing and Materials International document entitled "Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus."

"ASTM C 272-01(2007)" means the American Society for Testing and Materials International document entitled "Standard Test Method for Water Absorption of Materials for Structural Sandwich Constructions,"

"ASTM C 302-95(reapproved 2007)" means the American Society for Testing and Materials International document entitled "Standard Test Method for Density and Dimensions of Preformed Pipe-Covering-Type Thermal Insulation."

"ASTM C 303-10" means the American Society for Testing and Materials International document entitled "Dimensions and Density of Preformed Block and Board-Type Thermal Insulation."

DRAFT

"ASTM C 335/C 335M-10e1" means the American Society for Testing and Materials International document entitled "Standard Test Method for Steady-State Heat Transfer Properties of Horizontal Pipe Insulation,"

"ASTM C 516-08" means the American Society for Testing and Materials International document entitled "Standard Specification for Vermiculite Loose Fill Thermal Insulation."

"ASTM C 518-10" means the American Society for Testing and Materials International document entitled "Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus."

"ASTM C 533-09" means the American Society for Testing and Materials International document entitled "Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation."

"ASTM C 534/C 534M-08" means the American Society for Testing and Materials International document entitled "Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form."

"ASTM C 547-11" means the American Society for Testing and Materials International document entitled "Standard Specification for Mineral Fiber Pipe Insulation."

"ASTM C 549-06" means the American Society for Testing and Materials International document entitled "Standard Specification for Perlite Loose Fill Insulation."

"ASTM C 552-07" means the American Society for Testing and Materials International document entitled "Standard Specification for Cellular Glass Thermal Insulation."

"ASTM C 553-11" means the American Society for Testing and Materials International document entitled "Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications."

"ASTM C 567-05a" means the American Society for Testing and Materials International document entitled "Standard Test Method for Determining Density of Structural Lightweight Concrete."

"ASTM C 578-10a" means the American Society for Testing and Materials International document entitled "Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation."

"ASTM C 591-11" means the American Society for Testing and Materials International document entitled "Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation."

"ASTM C 592-10" means the American Society for Testing and Materials International document entitled "Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type.)"

"ASTM C 610-10" means the American Society for Testing and Materials International document entitled "Standard Specification for Molded Expanded Perlite Block and Pipe Thermal Insulation."

"ASTM C 656-07" means the American Society for Testing and Materials International document entitled "Standard Specification for Structural Insulating Board, Calcium Silicate."

"ASTM C 665-06" means the American Society for Testing and Materials International document entitled "Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufacture Housing."

"ASTM C 687-07" means the American Society for Testing and Materials International document entitled "Standard Practice for Determination of Thermal Resistance of Loose-Fill Building Insulation."

"ASTM C 726-05e1" means the American Society for Testing and Materials International document entitled "Standard Specification for Mineral Fiber Roof Insulation Board."

"ASTM C 739-11" means the American Society for Testing and Materials International document entitled ''Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation.''

"ASTM C 764-07" means the American Society for Testing and Materials International document entitled "Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation."

"ASTM C 1014-08" means the American Society for Testing and Materials International document entitled "Standard Specification for Spray-Applied Mineral Fiber Thermal and Sound Absorbing Insulation."

"ASTM C 1029-10" means the American Society for Testing and Materials International document entitled "Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation."

DRAFT

"ASTM C 1045-07" means the American Society for Testing and Materials International document entitled ''Standard Practice for Calculating Thermal Transmission Properties under Steady-State Conditions.''

"ASTM C 1071-05e1" means the American Society for Testing and Materials International document entitled "Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material)."

"ASTM C 1104 / C1104M-00(2006)" means the American Society for Testing and Materials International document entitled "Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation."

"ASTM C 1114-06" means the American Society for Testing and Materials International document entitled ''Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Thin-Heater Apparatus.''

"ASTM C 1126-11e1" means the American Society for Testing and Materials International document entitled "Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation."

"ASTM C 1149-08" means the American Society for Testing and Materials International document entitled ''Standard Specification for Self-Supported Spray Applied Cellulosic Thermal Insulation.''

"ASTM C 1224-09" means the American Society for Testing and Materials International document entitled ''Standard Specification for Reflective Insulation for Building Applications.''

"ASTM C 1258-08" means the American Society for Testing and Materials International document entitled "Standard Test Method for Elevated Temperature and Humidity Resistance of Vapor Retarders for Insulation."

"ASTM C 1289-10" means the American Society for Testing and Materials International document entitled "Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board."

"ASTM C 1290-11" means the American Society for Testing and Materials International document entitled "Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts."

"ASTM C 1303/C 1303M-11" means the American Society for Testing and Materials International document entitled "Standard Test Method for Predicting Long-Term Thermal Resistance of Closed-Cell Foam Insulation."

"ASTM C 1304-08" means the American Society for Testing and Materials International document entitled "Standard Test Method for Assessing the Odor Emission of Thermal Insulation Materials."

"ASTM C 1313/C 1313M-10" means the American Society for Testing and Materials International document entitled "Standard Specification for Sheet Radiant Barriers for Building Construction Applications."

"ASTM C 1338-08" means the American Society for Testing and Materials International document entitled "Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings."

"ASTM C 1363-11" means the American Society for Testing and Materials International document entitled ''Standard Test Method for the Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.''

"ASTM C 1371-04a(2010)e1" means the American Society for Testing and Materials International document entitled "Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers."

"ASTM C 1373-03" means the American Society for Testing and Materials International document entitled "Standard Practice for Determination of Thermal Resistance of Attic Insulation Systems Under Simulated Winter Conditions."

"ASTM C 1374-03 (Reapproved 2009)" means the American Society for Testing and Materials International document entitled ''Standard Test Method for Determination of Installed Thickness of Pneumatically Applied Loose-Fill Building Insulation."

"ASTM C 1393-11" means the American Society for Testing and Materials International document entitled "Standard Specification for Perpendicularly Oriented Mineral Fiber Roll and Sheet Thermal Insulation for Pipes and Tanks."

"ASTM C 1410-10" means the American Society for Testing and Materials International document entitled "Standard Specification for Cellular Melamine Thermal and Sound-Absorbing Insulation."

"ASTM C 1427e1-07" means the American Society for Testing and Materials International document entitled "Standard Specification for Extruded Preformed Flexible Cellular Polyolefin Thermal Insulation in Sheet and Tubular Form."

"ASTM C 1482-10" means the American Society for Testing and Materials International document entitled "Standard Specification for Polyimide Flexible Cellular Thermal and Sound Absorbing Insulation."

DRAFT

"ASTM C 1484-10" means the American Society for Testing and Materials International document entitled "Standard Specification for Vacuum Insulation Panels."

"ASTM C 1497-04" means the American Society for Testing and Materials International document entitled "Standard Specification for Cellulosic Fiber Stabilized Thermal Insulation."

"ASTM C 1534-07e1" means the American Society for Testing and Materials International document entitled "Standard Specification for Flexible Polymeric Foam Sheet Insulation Used as a Thermal and Sound Absorbing Liner for Duct Systems."

"ASTM C 1594-10" means the American Society for Testing and Materials International document entitled "Standard Specification for Polyimide Rigid Cellular Thermal Insulation."

"ASTM C 1639-10a" means the American Society for Testing and Materials International document entitled "Standard Specification for Fabrication Of Cellular Glass Pipe And Tubing Insulation."

"ASTM D 2126-09" means the American Society for Testing and Materials International document entitled "Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging."

"ASTM D 2261-07ae1" means the American Society for Testing and Materials International document entitled "Standard Test Method for Tearing Strength of Fabrics by the Tongue (Single Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine)."

"ASTM D 3310-00(2006)" means the American Society for Testing and Materials International document entitled "Standard Test Method for Determining Corrosivity of Adhesive Materials."

"ASTM E 84-11a" means the American Society for Testing and Materials International document entitled "Standard Test Method for Surface Burning Characteristics of Building Materials."

"ASTM E 96/E 96M-10" means the American Society for Testing and Materials International document entitled "Standard Test Methods for Water Vapor Transmission of Materials."

"ASTM E 283-04(2012)" means the American Society for Testing and Materials International document entitled "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across The Specimen."

"ASTM E 408-71(2008)" means the American Society for Testing and Materials International document entitled, "Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques."

"ASTM E 1269-05" means the American Society for Testing and Materials International document entitled "Standard Test Method for Determining Specific Heat Capacity by Differential Scanning Calorimetry."

"ASTM E 1677-05" means the American Society for Testing and Materials International document entitled "Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Building Walls."

"ASTM E 1680-11" means the American Society for Testing and Materials International document entitled "Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems."

"ASTM E 2178-03" means the American Society for Testing and Materials International document entitled "Standard Test Method for Air Permeance of Building Materials."

"ASTM E 2231-09" means the American Society for Testing and Materials International document entitled "Standard Practice for Specimen Preparation and Mounting of Pipe and Duct Insulation Materials to Assess Surface Burning Characteristics."

"ASTM E 2357-05" means the American Society for Testing and Materials International document entitled "Standard Test Method for Determining Air Leakage of Air Barrier Assemblies."

"ASTM E 2599-11" means the American Society for Testing and Materials International document entitled "Standard Practice for Specimen Preparation and Mounting of Reflective Insulation Materials and Radiant Barrier Materials for Building Applications to Assess Surface Burning Characteristics."

"ASTM E 2716-09" means the American Society for Testing and Materials International document entitled "Standard Test Method for Determining Specific Heat Capacity by Sinusoidal Modulated Temperature Differential Scanning Calorimetry."

"HUD Bulletin No. 74" means U.S. Department of Housing and Urban Development, Bulletin 74, "Thermal Insulation, Urea-based, Foamed in place", October 13, 1977.

DRAFT

"ISO 3998:1977" means the International Organization for Standardization document entitled "Textiles - Determination of resistance to certain insect pests."

"UL 181" means the Underwriters Laboratories document entitled "Standard for Factory-Made Air Ducts and Air Connectors," 1996.

Authority cited: 19164, Business and Professions Code.
Reference: Sections 19018,19019,19020,19021, 19022, 19034, 19164, and 19165, Business and Professions Code.

Quality Standards

Sec. 12-13-1553. ~~The manufacturer shall cause the~~ Ttesting of samples of insulating material ~~for conformity with the quality standards described in this section~~.

(a) General testing provisions. In testing any material pursuant to this section, the following general procedures shall be used.

1. All tests with the exception of the ~~ANSI/~~ASTM E 84-~~79~~11a test shall be conducted using representative samples at the representative thickness of the insulation, except that when the final use of an insulating material entails a thickness less than the representative thickness, then the insulating material will be tested at the lesser thickness.

   The ASTM E 84-11a test shall be conducted using the maximum thickness and density for use. Samples at greater than 4 inches in thickness must meet the requirements of the CBC.

2. Where uniformity of product ensures consistency of test results across a product grouping, test results for one may be used for certification of other products within that product group. The manufacturer shall provide ~~sufficient~~ documentation to ~~establish a valid basis for applying~~ demonstrate uniformity of product in order to apply a particular test result to other products within the group.

   The ~~Executive Director~~ Bureau shall determine on a case by case basis whether a valid basis exists for grouping products for testing pursuant to this subsection. If ~~it is~~the Bureau determines~~d~~ that a valid basis does not exist for grouping products for testing, the Bureau may order that individual tests ~~shall~~ be performed ~~required~~. ~~A manufacturer may appeal the Executive Director's determination that a valid basis does not exist to the full Commission .~~

   The Bureau shall determine the adequacy of the test used to determine thermal performance and emittance. Where challenges of testing values have been submitted to the Bureau or are initiated by the Bureau, the Bureau, in consultation with the California Energy Commission, may certify the insulating material by applying testing and rating provisions similar to those defined in this section as it deems most appropriate on a case by case basis.

3. Thermal performance of building insulations shall be stated in ~~R~~R-value. Other insulation~~s~~ materials shall use thermal conductivity, conductance, ~~or R~~R-value, U-factor, or thermal emittance as the Bureau deems appropriate on a case by case basis.

4. All thermal performance tests shall be conducted on materials which have been conditioned at 73.4° ± 3.6°F and a relative humidity of 50 ± 5 percent for 24 hours immediately preceding the tests. ~~The average testing temperature shall be 75° ± 2°F with at least a 40°F temperature difference.~~

5. All types of insulation and insulating systems except aluminum foil and other reflective insulations must be tested with ASTM C 177-10, ASTM C 518-10, ASTM C 1363-11, or ASTM C 1114-06. The tests must be performed at a mean temperature of 75 ° ± 2 °F and with a temperature differential of 50 ° ± 10 °F. The tests must be done on the insulation material alone (excluding any airspace). R-values (''thermal resistance'') based upon heat flux measurements according to ASTM C 177-10 or ASTM C 518-10 must be reported only in accordance with the requirements and restrictions of ASTM C 1045-07. Building Assembly framing percentages shall be based on the values set forth by the California Energy Commission ~~in Joint Appendix J4 of Part 6 of Title 24 of the California Code of Regulations,~~ or by a value determined by the California Energy Commission.

~~5.~~ 6. Aluminum foil and other reflective insulations shall be tested according to ~~ANSI/~~ASTM C ~~236-66~~1363-05 to determine the thermal performance in horizontal, upward and downward directions. For framed assemblies, a 25% framing percentage shall be used. The tested thermal performance in the heat-flow direction or directions of the intended application shall be labeled on the material. The manufacturer shall test once in each direction of intended application, except that for products labeled with only one heat-flow direction, the manufacturer shall test two samples in that direction. Single sheet systems of aluminum foil and other reflective insulations claiming a thermal emittance value must be tested with ASTM E 408-71(2008) or ASTM C 1371-04a(2010)e1.

~~6.~~ 7. Insulation (other than ~~aluminum foil~~ reflective insulation materials) for which additional R-value is claimed for facings and air spaces shall be tested for thermal performance as a material without the air space pursuant to this article. ~~The manufacturer may elect to report additional thermal performance values of a given construction tested according to~~

DRAFT

~~ANSI/ASTM C 236-66 for that construction as long as full details of that construction are also disclosed in the certification statement and pursuant to Section 1557 (c) of this article. If a manufacturer elects to report a thermal performance value for a material plus an air space (as supplemental information to the required material thermal performance), but not necessarily for a full construction, the manufacturer must also disclose the conditions of the test and the limitations to the attainment of that result.~~

~~7.~~ 8. Except as provided in Items ~~5~~6 and ~~6~~7, the thermal performance test results certified under Section 12-13-1555 of this article shall be the average of the values obtained from at least three tests.

~~8.~~ 9. The average measured thermal performance of the tests required by Items ~~5~~ 6, ~~6~~ 7 and ~~7~~ 8 shall not be more than 5 percent below the value specified on the product. In addition, all insulation material sold within the state ~~after September 22, 1981,~~ shall have a measured thermal performance not more than 10 percent below the value specified on the product.

10. Facings on representative samples may be removed or modified by slitting for the ~~ANSI/~~ASTM C 177-~~76~~10 and ~~ANSI/~~ASTM C 518-~~76~~10 tests.

11. All thermal performance testing equipment used for testing insulating materials shall be calibrated with samples referenced to the United States National ~~Bureau~~ Institute of Standards and Technology.

12. Manufacturers of loose fill insulations for which no settled density test is required by this section shall ~~be required to~~ include the installed design density in the identifying information described in Section 12-13-1557. The manufacturer shall provide ~~sufficient~~ design density test documentation to establish a valid basis for the determination of installed design density.

The ~~Executive Director~~ Bureau shall determine on a case by case basis whether a valid basis exists for the installed design density claimed by the manufacturer. If it is determined that a valid basis for the claimed installed design density does not exist, the ~~director~~ Bureau may order the manufacturer to perform ~~assign an appropriate installed design density or may require~~ an ~~appropriate~~ a test to determine the installed design density. ~~The manufacturer may appeal the Executive Director's determination to the full Commission.~~

13. Within 180 days after the availability of appropriate representative thickness calibration samples from the National Institute ~~Bureau~~ of Standards and Technology all insulating materials thicker than 1 inch, which have not previously been tested at the representative thickness of a representative sample, shall be tested at representative thickness and recertified. The manufacturer shall submit ~~T~~test results and a revised certification statement ~~will be submitted~~ to the ~~Executive Director~~ Bureau. ~~The Executive Director shall determine if and when an appropriate representative thickness calibration sample is available from the National Bureau of Standards and shall publish a list of available representative thickness calibration samples. The manufacturer may appeal the Executive Director's determination to the full Commission.~~

14. All products which may be used for pressure fill retrofit wall application shall be separately tested for thermal performance using a sample prepared at the manufacturer's recommended wall density for such applications.

15. All water heater insulation kits and nonpreformed pipe insulation shall be tested for thermal performance thermal performance at the installed compressed thickness of a typical application. ~~Installed compressed thickness shall be determined according to Test Description Number 6.~~ All nonpreformed duct insulation shall be labeled, in accordance with Section 12-13-1557(c), with an installed ~~*R*~~R-value equal to the ~~*R*~~R-value of the uncompressed insulation ~~times~~ multiplied by 0.75.

(b) ~~**Aluminum Foil.**~~ **BLANKET OR BATT**

This section covers the standards for testing of the blanket and batt forms of materials including, but not limited to, fiber glass, cotton, mineral fiber, polyester, wool and ceramic fiber.

1. **Composition.** ~~The insulation shall have uniform flat surfaces and shall not be crumpled, torn or punctured. Aluminum foil shall contain not less than 99 percent aluminum. Kraft paper and flangeboard shall meet the requirements of ANSI/TAPPI T400 0S75. Flangeboard used for more than two insulation layers shall be of 28 point grade minimum, if single sheet flangeboard is used or 14 point grade minimum if double sheet flangeboard is used.~~

Mineral fiber (rock, slag, glass) shall be made and manufactured as defined in Section 6 of ASTM C 665-06 or Section 6 of ASTM C 553-11 or Section 6 of ASTM C 592-10. Asbestos shall not be used as an ingredient or component.

~~Adhesive used in bonding shall be waterproof and shall show no sign of bleeding when tested in accordance with the following test procedure. Bleeding at cut edges may be disregarded.~~

~~Specimens for tests shall consist of pieces of insulation cut to approximately 3 by 6 inches, suspended in a vertical position and heated to a temperature of 180°F ± 5°F for at least five hours. At the end of heating period, examine the~~

DRAFT

~~reflective surfaces to determine whether the adhesive has bled or extruded through the surface, or delamination has occurred.~~

2. **Thermal performance.** ~~Thermal performance shall be determined according to ANSI/ASTM C 236-66. The test panel shall consist of a panel utilizing a wooden frame of 2 by 6 inches construction covered with 3/4-inch plywood on both sides. The resultant thermal performance shall be based on the insulation only.~~ Determination of thermal performance shall be in accordance with ASTM C 177-10, ASTM C 1363-11, ASTM C 518-10, or ASTM C 1114-06 at the manufacturer's or tester's option.

3. **Size.** ~~Layers of insulation composed of unsupported foil that is exposed shall have a minimum thickness of 0.0004 inch. Unsupported foil that is sandwiched in a multilayer sheet shall have a minimum thickness of 0.00035 inch. Foil bonded to kraft paper shall have a minimum thickness of 0.00025 inch. Minimum space between layers of a multilayer sheet shall conform with the United States General Services Administration insulation standard HH-I-I252B dated August I8, 1976.~~

   (A) The thickness shall be determined according to ASTM C 167-09.
   (B) For water heater insulation kits, the installed compressed thickness shall be determined as follows:

   i. **Apparatus:**
      (a) Using a depth gauge as described in ASTM C 167-09.
      (b) Cylinders at least one foot in length, with the following diameters: 20 inches ± 2 inches and 1 inch ± ¼ inch.

   ii. **Procedure:** Water heater jacket material shall be wrapped around the 20 inch cylinder; nonpreformed pipe insulation shall be wrapped around the 1 inch cylinder. All cylinders shall be vertically placed so that their bases rest on the flat surface of the work table. The specimens shall be held in place by the manufacturer's recommended attachment method. The thickness measurements shall be made by penetrating the pin of the depth gauge downward through the specimen, perpendicular to the surface of the cylinder. If necessary to prevent compression of the specimen by the depth gauge pin, the specimen shall first be pierced. When the point of the pin touches the cylinder, the sliding disk shall be lowered to the point of contact with the top surface of the specimen. The gauge shall be withdrawn and the distance shall be measured from the point of the pin to the sliding disk within an accuracy of ± 1/16 inch (or 1 mm). The measurement procedure shall be repeated three times at random locations and the thickness results shall be averaged.

4. **Resistance to combustion.** Unless stated otherwise in this subsection, ~~S~~surface-burning characteristics of unfaced materials shall be determined according to the ~~ANSI/~~ASTM E 84-~~79~~11a, and shall not exceed the following values:

   Flame spread 25
   Smoke developed 50

   Cotton fiber batting and Polyester fiber batting exclusive of facings and membranes shall not exceed the following values:

   Flame spread 25
   Smoke developed 450

   Surface-burning characteristics of materials with facings and membranes intended for exposed applications shall be determined according to ASTM E 84-11a and shall not exceed the following values:

   Flame spread 25
   Smoke developed 50

   Facings and membranes of materials intended for exposed applications shall be exposed to the flame during the ASTM E 84-11a test.

5. ~~**Pliability.** Foil shall be folded and the folded edge smoothed using a light finger pressure. The finished insulation shall not crack when folded to 180° bend at a temperature of 70° ± 2°F and a relative humidity of 50 ± 5 percent.~~ **Corrosiveness.** Unless stated otherwise in this subsection, the material shall be tested and shall meet the criteria for corrosiveness as specified in ASTM C 665-06, Sec. 7.7.

   For cotton batting, the material shall be tested and shall meet the criteria for corrosiveness as specified in ASTM C 739-11, Sec. 9.

6. **Resistance to fungi.** Unless stated otherwise in this subsection, the material shall be tested and shall meet the criteria for resistance to fungi as specified in ASTM C 665-06, Sec. 7.8.

   For cotton batting, the material shall be tested and shall meet the criteria for resistance to fungi as specified in ASTM C 739-11, Sec. 11.

DRAFT

7. **Odor emission.** Unless stated otherwise in this subsection, the material shall be tested and shall meet the criteria for odor emission as specified in ASTM C 665-06, Sec. 7.6.

   For cotton batting, the material shall be tested and shall meet the criteria for odor emission as specified in ASTM C 739-11, Sec. 13.

8. **Water vapor permeance.** Unless stated otherwise in this subsection, the material shall be tested and shall meet the criteria for water vapor permeance as specified in ASTM C 665-06, Sec. 7.4.

9. **Water vapor sorption or Moisture vapor sorption.** Unless stated otherwise in this subsection, the material shall be tested and shall meet the criteria for water vapor sorption as specified in ASTM C 665-06, Sec. 7.5.

   For cotton batting, the material shall be tested and shall meet the criteria for moisture vapor sorption as specified in ASTM C 739-11, Sec. 12.

10. **Resistance to vermin.** For wool batting, resistance to vermin for animal based materials such as wool shall be determined according to ISO 3998:1977.

(c) ~~**Cellular Glass in Board Form.**~~ **BLOCK OR BOARD**

This section covers the testing of the block and board forms of materials including, but not limited to, fiber glass, cellulose, mineral fiber, wool, ceramic fiber, cellular glass, mineral aggregate, polyisocyanurate, polystyrene, polyurethane, polyimide, calcium silicate, elastomeric (rubber), neoprene foam and phenolic foam.

1. **Composition.** ~~The material shall consist of a glass composition which has been foamed or cellulated under molten conditions annealed and set to form a rigid material with hermetically sealed cells.~~
   Calcium silicate board shall be made and manufactured as defined in Section 5 of ASTM C 533-09 or Section 6 of ASTM C 656-07. Asbestos shall not be used as an ingredient or component.

   Cellular glass board shall be made and manufactured as defined in Section 6 of ASTM C 552-07.

   Cellular polyolefin sheet shall be made and manufactured as defined in Section 5 of ASTM C 1427-07.

   Elastomeric sheet shall be made and manufactured as defined in Section 5 of ASTM C 534/C 534M-08.

   Melamine foam board shall be made and manufactured as defined in Section 6 of ASTM C 1410-10.

   Mineral aggregate board shall be composed of spherical cellular beads of expanded aggregate and fibers formed into rigid, flat, rectangular units and shall have an integral water proofing treatment. It shall be clean, dry and free of extraneous material. Fibers shall be evenly distributed and insulation and facings shall be sufficiently coherent to be unaffected by handling and installation.

   Mineral fiber board (rock, slag, glass) shall be made and manufactured as defined in Section 6 of ASTM C 612-04 or Section 6 of ASTM C 726-05. An insulation board shall be uniform in quality and free from defects, such as broken edges, splits or loose materials that would impair its intended use.

   Perlite block shall be made and manufactured as defined in ASTM C 610-10.

   Phenolic board shall be made and manufactured as defined in Section 6 of ASTM C 1126-11e1.

   Polyimide board shall be made and manufactured as defined in Section 5 of ASTM C 1482-09. The theoretical mole fraction of imide bonds must be greater than the theoretical mole fraction of amide bonds.

   Polyurethane board shall be of uniform texture, free from accumulation of unexpanded material and foreign inclusions, broken edges and corners, holes, voids, depressions and objectionable odor. The faces of laminated boards shall adhere firmly throughout to the foam, and shall show no excessive amounts of slits, voids or depressions.

   Polyisocyanurate block or board shall be made and manufactured as defined in Section 6 of ASTM C 1289-10 or Section 6 of ASTM C 591-11. The board shall be of uniform texture, free from accumulation of unexpanded material and foreign inclusions, broken edges and corners, holes, voids, depressions and objectionable odor. Laminated composite boards shall be included in this quality standard. The faces of laminated boards shall adhere firmly throughout to the polyisocyanurate board, and shall show no excessive amounts of slits, voids or depressions.

   Polystyrene board shall be made and manufactured as defined in Section 6 of ASTM C 578-10a. The EPS insulation shall be uniformly fused, homogeneous, and essentially unicellular. All insulation boards shall be uniform in physical properties and reasonably free of voids or accumulations of unexpanded material. Both EPS and XPS boards shall be free of foreign inclusions, broken corners and broken edges.

DRAFT

2. **Thermal performance.** Determination of the thermal performance shall be based on a representative sample and shall be in accordance with ~~ANSI/~~ASTM C 177-~~76~~10, or ~~ANSI/~~ASTM C ~~236-66~~1363-05, or ~~ANSI/~~ASTM C 518-~~76~~10, or ASTM C 1114-06 at the manufacturer's or tester's option.

   All foam insulation materials using materials other than air or pentane as an expanding agent shall be conditioned prior to R-value testing by one of the following methods at the manufacturer's or tester's option:

   A. Condition samples at 73.4° ± 2°F and a relative humidity of 50 ± 5 percent for a period of 180 days; or
   B. Condition samples at 140°F ± 2°F dry heat for a period of 90 days.

3. **Resistance to combustion.**

   A. Unless stated otherwise in this subsection, ~~S~~surface-burning characteristics shall be determined according to ~~ANSI/~~ASTM E 84-~~79~~11a, and shall not exceed the following values:

      Flame spread 25
      Smoke developed 50

   B. Surface-burning characteristics of non-roofing insulation blocks or boards shall be determined according to ASTM E 84-11a, and shall not exceed the following values for unexposed blocks and boards:

      Flame spread. 75
      Smoke developed 450

   C. **Mineral fiber and Mineral aggregate boards:** Surface-burning characteristics of materials with facings and membranes intended for exposed applications shall be determined according to ASTM E 84-11a and shall not exceed the following values:

      Flame spread 25
      Smoke developed 50

      Facings and membranes of materials intended for exposed applications shall be exposed to the flame during the ASTM E 84-11a test.
      Insulation boards exclusive of facings and membranes shall not exceed the following values:

      Flame spread 25
      Smoke developed 50

   D. **Foam insulation boards:** The material shall be tested to meet the requirements of Sections 2602.1-2602.6 of the CBC ~~2007 Uniform Building Code , with the additional provision that the surface-burning characteristics shall be determined according to ASTM E 84-11a and shall not exceed the following values:~~

      ~~Flame spread ..... 75~~
      ~~Smoke developed ..... 450~~

      This subsection shall not apply to any product recognized by the International Conference of Building Officials as complying with Sections 2602.1-2602.6 of the CBC ~~2007 Uniform Building Code~~ based solely upon diversified testing. The manufacturer of any product which is recognized by the International Conference of Building Officials as complying with Sections 2602.1-2602.6 of the CBC ~~2007 Uniform Building Code~~ based solely upon diversified testing shall be exempted from this subsection.

4. **Dimensional stability.** All foamed insulation materials which are factory formed shall be tested for dimensional stability in accordance with ASTM D 2126-09 at 158º ± 4ºF, at 97 ± 3 percent relative humidity and -40º ± 6ºF at ambient air with the following exceptions: (A) sample sizes that are 12 inches by 12 inches ± 1 inch, and (B) samples that are tested as manufactured with or without facers.

   The average percent change in length or width shall not exceed ± 2 percent in 24 hours or ± 4 percent in seven days. The average percent change in thickness shall not exceed ± 10 percent in seven days. Samples shall be regarded as failing if: (1) delamination area of "faced" samples exceeds 25 percent or (2) warping or cupping exceeds 1/4 inch when checked by a straight edge across raised diagonal corners.

5. **Water vapor permeance.** Water vapor permeance shall be determined using the Desiccant Method of ASTM E 96/E 96M-10.

6. **Water absorption.** For foam boards or blocks, the material shall be tested and shall meet the criteria for water

DRAFT

absorption as specified in Test Method A - 24 Hour-Immersion of ASTM C 272-01(2007).

(d) ~~**Cellulose Fiber in Loose Fill Form.**~~ **DUCTING**

This section covers the testing of air duct form of materials including, but not limited to, fiber glass, mineral fiber, ceramic fiber and phenolic foam in the duct liner, duct wrap, duct board and duct systems forms.

All ducting insulation and duct lining in plenums shall comply with the CMC.

All preformed ducting and duct boards shall meet the standards set forth in UL 181.

1. **Composition.** ~~The basic material shall consist of virgin or recycled wood-based cellulosic fiber and may be made from related paper or paperboard stock, excluding contaminated materials and extraneous foreign materials such as metals and glass which may reasonably be expected to be retained in the finished product. Suitable chemicals may be introduced to improve flame resistance, processing and handling characteristics. The particles shall not be so fine as to create a dust hazard, and the added chemicals shall not create a health hazard. The materials used must be capable of proper adhesion to the additive chemicals.~~

   Mineral fiber duct liner shall be made and manufactured as defined in Section 6 of ASTM C 1071-05.

   Polymeric foam sheet duct liner shall be made and manufactured as defined in Section 5 of ASTM C 1534-07.

   Mineral fiber duct wrap shall be made and manufactured as defined in Section 6 of ASTM C 1290-11.

2. **Thermal performance.** ~~Determination of the thermal performance shall be in accordance with ANSI/ASTM C 177-76 , ANSI/ASTM C 236-66 or ANSI/ASTM C 518-76 at the manufacturer's option~~ All duct insulation product R-values shall be based on insulation only and tested C-values at 75°F mean temperature at the installed thickness, in accordance with ASTM C 177-10 or ASTM C 518-10 at the manufacturer's or tester's option. The R-values for air films, vapor barriers, or other duct components shall be excluded from this requirement.

~~3. **Density.** The density shall be determined according to the United States General Services Administration insulation standard HH-I-515D dated June 15, 1975, or as amended October 11, 1979, at the manufacturer's option. Cellulose insulation made from newsprint may use a 13 percent settling percentage along with the drop box procedure in place of the humidity cycling procedure described in HH-I-515D dated June 15, 1978. All other tests for loose fill cellulose fiber insulation prescribed by this section shall be conducted at the settled density as determined herein.~~

3. **Size.** The installed thickness of duct insulation used to determine its R-value shall be determined as follows:

   A. For duct board, duct liner, and factory-made rigid ducts not normally subjected to compression, the nominal insulation thickness shall be used.
   B. For duct wrap, installed thickness shall be assumed to be 75 percent (25 percent compression) of nominal thickness.
   C. For factory-made flexible air ducts, the installed thickness shall be determined by dividing the difference between the actual outside diameter and nominal inside diameter by two.

~~4. **Resistance to combustion.** Flammability characteristics shall comply with the standard for flammability and smoldering combustion in 44 Fed. Reg. pages 39966-39973.~~

4. **Resistance to combustion.** Surface burning characteristics shall be determined according to ASTM E 84-11a and installed as specified according to ASTM E 2231-09 and shall not exceed the following values:

   Flame spread 25
   Smoke developed 50

   Surface-burning characteristics of insulation applied to the exterior surface of sheet-metal ducts located on the exterior of buildings shall be determined according to ASTM E 84-11a and installed as specified according to ASTM E 2231-09, and shall not exceed the following values:

   Flame spread..... 75
   No smoke developed number required.

~~5. **Resistance to fungi.** Resistance to fungi shall be determined according to Method 508 of the March 10, 1975, edition of the Military Standard for Environmental Test Methods known as MIL-STD-810C, except the spore suspensions shall be prepared using distilled water. The core of gypsum wall board shall be used as the control. After the test exposure, the test samples shall show no more fungal growth than the control material when examined at 40 times magnification.~~

DRAFT

5. **Water vapor permeance.** Water vapor permeance shall be determined using the Desiccant Method of ASTM E 96/E 96M-10.

~~6. **Corrosiveness.** The product shall comply with the standard for corrosiveness set forth in 44 Fed. Reg. pages 39966-39973.~~

~~7. **Odor emission.** Odor emission shall be determined according to Test Description Number 3. A detectable odor of objectionable nature observed by two or more of the panel members shall be cause for rejection.~~

~~8. **Identification.** Each insulation container shall be marked with the type (pouring or pneumatic), net weight and the manufacturer's recommendations for installation including minimum thickness, maximum coverage and settled density to provide the levels of thermal performance shown. Manufacturer's installation recommendations shall include precautions according to the *California Electrical Code*® Section 410-66.~~

~~Insulation which may be used for pressure fill retrofit wall application shall be marked with the recommended wall density to prevent settling and separately marked with the tested thermal performance for such applications.~~

(e) ~~**Cellulose Fiber Spray Applied**~~ **INSULATION SYSTEMS**

This section covers the testing of insulation systems including, but not limited to the entire assembly of individual components making up a wall, ceiling, roof, or floor; concrete blocks with polystyrene inserts; large scale metal frames with thermal breaks; air core concrete; and polystyrene aggregate concrete.

~~1. **Composition.** The basic material shall consist of virgin or recycled wood-based cellulosic fiber and may be made from related paper or paperboard stock, excluding contaminated materials and extraneous foreign materials such as metals and glass which may reasonably be expected to be retained in the finished product. Suitable chemicals may be introduced to improve flame resistance, processing, adhesive and cohesive qualities, and handling characteristics. The added chemicals shall not create a health hazard.~~

~~The basic material shall be processed into a form suitable for installation by pneumatic conveying equipment and simultaneous mixing with water and/or adhesive at the spray nozzle.~~

~~2. **Thermal performance.** Determination of the thermal performance shall be in accordance with ANSI/ASTM C 177-76, ANSI/ASTM C 236-66, or ANSI/ASTM C 518-76 at the manufacturer's option.~~

~~3. **Resistance to combustion.** Flammability characteristics shall comply with the standard for flammability and smoldering combustion in 44 Fed. Reg. pages 39966-39973.~~

~~4. **Corrosiveness.** The product shall comply with the standard for corrosiveness set forth in 44 Fed. Reg. pages 39966-39973.~~

~~5. **Bond strength.** The bond strength shall be determined by Test Description Number 3 and the bond shall support a force five times the weight of the sample for one minute.~~

~~6. **Bond deflection.** The bond deflection shall be determined by Test Description Number 4 and shall be greater than 1/60th of the length of the sample.~~

~~7. **Air erosion.** The air erosion shall be determined by Test Description Number 5 and shall withstand an air velocity of 800 ft./ min.~~

~~8. **Odor emission.** Odor emissions shall be determined by Test Description Number 1. A detectable odor of objectionable nature observed by two or more panel members shall be cause for rejection.~~

~~9. **Fungi resistance.** Resistance to fungi shall be determined according to Method 508 of the March 10, 1975, edition of the Military Standard for Environmental Test Methods known as MIL-STD-810C, except the spore suspensions shall be prepared using distilled water, and observations shall be made at seven-day intervals during the 28-day cycle to determine the minimum length of time required for fungal growth to appear. Viability of the spore organisms shall be determined by injecting or inoculating a separate bottle of culture medium with the spore preparation for each organism and observing for growth and individual viability. The back side of 1/2 inch standard commercial grade gypsum wall board grayback paper surface shall be used as the control. After the test exposure, the test samples shall be examined at 40 times magnification for evidence of fungal growth. The material shall show no more fungal growth than the control material.~~

~~10. Test procedures described in Items 5, 6 and 7 are not required of products which are installed in such a manner that physical restrictions imposed by the construction elements preclude any possibility of subsequent delamination, erosion, or dusting and the product is identified only for such installations.~~

1. **Thermal performance.** Determination of the thermal performance shall be in accordance with ~~ASTM C 177-10,~~ ASTM C 1363-11~~ or ASTM C 518-10 at the manufacturer's option~~. In addition, the report shall list the thickness used for the test**.**

2. **Density.** Determination of density shall be in accordance with ASTM C 567-05a, ASTM C 1386-07 or ASTM C 303-10.

3. **Specific heat capacity.** Determination of heat capacity shall be in accordance with ASTM E 1269-05 or ASTM E 2716-09.

4. **Air barrier leakage rate.** Air barrier leakage rate shall be determined in accordance with ASTM E 2357, ASTM E 2178

DRAFT

, ASTM E 1680, ASTM E 283 or ASTM E 1677.

5. **Water vapor permeance.** Water vapor permeance shall be determined using the Desiccant Method of ASTM E 96/E 96M-10.

6. **U-FACTOR.** Assembly U-factor shall be determined in accordance with the thermal performance testing and procedures specified in ASHRAE Handbook of Fundamentals.

(f) ~~**Mineral Aggregate in Board Form.**~~ **LOOSE FILL**

This section covers the testing of the loose fill form of materials including, but not limited to, fiber glass, cellulose, mineral fiber, wool, perlite, vermiculite, cotton and polyester fiber.

For loose-fill cellulose, the tests shall be done at the settled density determined under paragraph 8 of ASTM C 739-11, For loose-fill mineral wool, the tests shall be done on samples that fully reflect the effect of settling on the product's R-value.

For loose-fill insulations, the initial installed thickness for the product shall be determined pursuant to ASTM C 1374-03 (Reapproved 2009), for R-values of 13, 19, 22, 30, 38, 49 and any other R-values provided on the product's label.

1. **Composition.** ~~The basic material shall be mineral in nature, crushed, dried, and graded to the proper particle size and expanded by the application of heat to form a spherical, cellular type of aggregate. It shall be composed of spherical cellular beads of expanded aggregate and fibers formed into rigid, flat, rectangular units and shall have an integral water proofing treatment. It shall be clean, dry and free of extraneous material. Fibers shall be evenly distributed and insulation and facings shall be sufficiently coherent to be unaffected by handling and installation.~~

   Loose fill cellulose shall not include contaminated materials or extraneous foreign materials such as metals and glass which may reasonably be expected to be retained in the finished product. Chemicals may be introduced to improve flame resistance, processing and handling characteristics. The particles shall not be so fine as to create a combustible dust, and the added chemicals shall not create a health hazard. The materials used must be capable of adhesion to the additive chemicals.

   Loose fill mineral fiber (rock, slag, glass) shall be mechanically processed to produce a mineral fiber suitable for pneumatic or poured application.

   Loose fill polyester shall be mechanically processed to produce a fiber for pneumatic application.

   Loose fill wool shall be mechanically processed to produce a fiber for pneumatic application.

2. **Thermal Performance.** ~~Determination of the thermal performance shall be in accordance with ANSI/ASTM C 177-76, ANSI/ASTM C 236-66, or ANSI/ASTM C 518-76 at the manufacturer's option.~~

   A. Unless stated otherwise in this subsection, determination of the thermal performance shall be in accordance with ASTM C 687-07 with ASTM C 177-10, ASTM C 1363-11, ASTM C 518-10 or ASTM C 1114-06 at the manufacturer's or tester's option.
   B. For loose-fill cellulose, determination of the thermal performance shall be in accordance with paragraph 15 of ASTM C 739-11.
   C. For loose-fill mineral fiber, determination of the thermal performance shall be in accordance with paragraph 12.2 of ASTM C 764-07.
   D. For perlite loose fill, determination of the thermal performance shall be in accordance with ASTM C 177-10, ASTM C 1363-11, ASTM C 518-10 or ASTM C 1114-06 at the manufacturer's or tester's option.
   E. For vermiculite loose fill, determination of the thermal performance shall be in accordance with ASTM C 177-10, ASTM C 1363-11, ASTM C 518-10 or ASTM C 1114-06 at the manufacturer's or tester's option.

~~3. **Resistance to combustion.** Surface-burning characteristics of materials with facings and membranes intended for exposed applications shall be determined according to ANSI/ASTM E 84-79 and shall not exceed the following values:~~

~~Flame spread ..... 25~~
~~Smoke developed ..... 450~~

~~Facings and membranes of materials intended for exposed applications shall be exposed to the flame during the ANSI/ASTM E 84-79 test.~~

~~Insulation boards exclusive of facings and membranes shall not exceed the following values:~~

~~Flame spread ..... 25~~
~~Smoke developed ..... 50~~

DRAFT

3. **Density.**

A. For loose-fill cellulose, the tests must be done at the design density determined under paragraph 8 of ASTM C 739-11. All tests should be tested at densities per ASTM C 739-11.
B. For loose-fill mineral fiber, the density shall be determined according to installed design density. All tests shall be conducted at the installed design density.
C. For perlite loose fill and vermiculite loose fill, density shall be determined according to installed design density. All tests except the ASTM E 84-11a test shall be conducted at the installed design density.

4. **Resistance to combustion.**

A. Unless stated otherwise in this subsection, determination of the resistance to combustion shall be in accordance with paragraph 12.3 of ASTM C 764-07 for critical radiant flux. The critical radiant flux shall be ≥ 0.12 W/m^2.
B. For loose-fill cellulose, determination of the resistance to combustion shall be in accordance with paragraph 10 of ASTM C 739-11 for flammability and paragraph 14 of ASTM C 739-11 for smoldering combustion.
C. For perlite loose fill, determination of the resistance to combustion shall be in accordance with paragraph 9.6 of ASTM C 549-06 for surface burning characteristics.
D. For vermiculite loose fill, surface burning characteristics shall be determined according to ASTM E 84-11a, and shall not exceed the following values:

Flame spread 25
Smoke developed 50

5. **Resistance to fungi.**

A. Unless stated otherwise in this subsection, the material shall be tested and shall meet the criteria for resistance to fungi as specified in paragraph 12.3 of ASTM C 1338-08.
B. For loose-fill cellulose, the material shall be tested and shall meet the criteria for resistance to fungi as specified in paragraph 11 of ASTM C 739-11.
C. For loose-fill mineral fiber, the material shall be tested and shall meet the criteria for resistance to fungi as specified paragraph 12.8 of ASTM C 764-07.

6. **Corrosiveness.**

A. For loose-fill cellulose and loose-fill polyester, the material shall be tested and shall meet the criteria corrosiveness as specified in paragraph 9 of ASTM C 739-11.
B. For loose-fill mineral fiber, the material shall be tested and shall meet the criteria corrosiveness as specified in paragraph 12.7 of ASTM C 764-07.

7. **Odor emission.**

A. Unless stated otherwise in this subsection, the material shall be tested and shall meet the criteria for odor emission as specified in paragraph 7.1 of ASTM C 1304-08.
B. For loose-fill cellulose, the material shall be tested and shall meet the criteria for odor emission as specified in paragraph 13 of ASTM C 739-11.
C. For loose-fill mineral fiber, the material shall be tested and shall meet the criteria for odor emission as specified in paragraph 12.6 of ASTM C 764-07.

8. **Identification.**

A. **Loose-fill cellulose.** Each insulation container shall be marked with: whether the loose-fill cellulose is a pouring or pneumatic type, its net weight and the manufacturer's recommendations for installation including minimum thickness, maximum coverage and design density to provide the levels of thermal performance shown. Manufacturer's installation recommendations shall include precautions according to the CEC CODES Section 410.116.

Insulation which may be used for pressure fill retrofit wall application shall be marked with the recommended wall density to prevent settling and separately marked with the tested thermal performance for such applications.

B. **Loose-fill mineral fiber**. Each insulation container shall be marked with: whether the loose-fill mineral fiber is a pouring or pneumatic type, its net weight and the manufacturer's recommendations for installation including minimum thickness, maximum coverage and installed design density to provide the levels of thermal performance shown. Manufacturer's installation recommendations shall include precautions according to the CEC CODES Section 410.116.

Products which may be used for pressure fill wall application shall be marked with the recommended wall density to

DRAFT

prevent settling and shall be separately marked with the tested thermal performance for such applications.

C. **Perlite loose fill**. Each insulation container shall be marked with: whether the perlite loose fill is a pouring or pneumatic type, its net weight and the manufacturer's recommendations for installation including minimum thickness, maximum coverage and installed design density to provide the levels of thermal performance shown. Manufacturer's installation recommendations shall include precautions according to the CEC CODES Section 410.116.

Products which may be used for pressure fill wall application shall be marked with the recommended wall density to prevent settling and shall be separately marked with the tested thermal performance for such applications.

D. **Vermiculite loose fill**. Each insulation container shall be marked with: whether the vermiculite loose fill is a pouring or pneumatic type, its net weight and the manufacturer's recommendations for installation including minimum thickness, maximum coverage and installed design density to provide the levels of thermal performance shown. Manufacturer's installation recommendations shall include precautions according to the CEC CODES Section 410.116.

Products which may be used for pressure fill wall application shall be marked with the recommended wall density to prevent settling and shall be separately marked with the tested thermal performance for such applications.

(g) ~~**Mineral Fiber in Blanket Form.**~~ **RADIANT BARRIER OR REFLECTIVE INSULATION**

This section covers the testing of the radiant barrier and reflective surface forms of materials including, but not limited to, aluminum foil reflective insulating ceramic coatings, low emittance paint and paint additives.

1. **Composition.** ~~The basic material shall be fibers made from mineral substances such as rock, slag or glass processes from a molten state into fibrous form.~~

Reflective insulation shall be made and manufactured as defined in Section 5 of ASTM C1224-09.

Radiant barrier insulation shall be made and manufactured as defined in Section 5 of ASTM C1313/C1313M-10.

2. **Thermal performance**. ~~Determination of the thermal performance shall be in accordance with ANSI/ASTM C 177-76 , ANSI/ASTM C 236-66 , or ANSI/ASTM C 518-76 at the manufacturer's option.~~ For radiant barriers and reflective insulation the thermal emittance and R-value are determined as follows:

A. **Thermal emittance.**
Single sheet systems of aluminum foil and other radiant barriers must be tested with ASTM E 408-71(2008), ASTM C 1371-04a(2010)e1, ASTM C 1313/C 1313M-10, or ASTM C 1224-09.

B. **R-value.**
Aluminum foil systems with more than one sheet, and single sheet systems of aluminum foil must be tested with ASTM C 1363-11 in a test panel constructed according to ASTM C 1224-09 and under the test conditions specified in ASTM C 1224-09. For framed assemblies, a 25% framing percentage shall be used. To get the R-value from the results of those tests, the manufacturer shall use the formula specified in ASTM C 1224-09.

~~3. **Size.** The thickness shall be determined according to ANSI/ASTM C 167-64.~~

~~4. **Resistance to combustion.** Surface-burning characteristics of materials with facings and membranes intended for exposed applications shall be determined according to ANSI/ASTM E 84-79 and shall not exceed the following values:~~

~~Flame spread.....25~~
~~Smoke developed .....450~~

~~Facings and membranes of materials intended for exposed applications shall be exposed to the flame during the ANSI/ASTM E 84-79 test.~~

~~Insulation blankets not intended for exposed applications shall comply with the United States General Services Administration insulation standard HH-I-521F dated September 4, 1980, for flammability and smoldering combustion testing.~~

~~5. **Corrosiveness.** Corrosiveness shall be determined according to Test Description Number 2. The steel test plate in contact with the insulation shall show no greater corrosion than a steel plate in contact with sterile cotton.~~

~~6. **Resistance to Fungi.** Resistance to fungi shall be determined according to Method 508 of the March 10, 1975, edition of the Military Standard for Environmental Test Methods known as MIL-STD-810C except the spore suspensions shall be prepared using distilled water. The core of gypsum wall board shall be used as the control. After the test exposure, the test samples shall show no more fungal growth than the control material when examined at 40 times magnification.~~

DRAFT

~~7. **Odor emission.** Odor emission shall be determined according to Test Description Number 1. A detectable odor of objectionable nature observed by two or more of the panel members shall be cause for rejection.~~

3. **Size.** Layers of insulation composed of unsupported aluminum foil that is exposed shall have a minimum thickness of 0.0004 inch. Unsupported aluminum foil that is sandwiched in a multilayer sheet shall have a minimum thickness of 0.00035 inch. Aluminum foil bonded to kraft paper shall have a minimum thickness of 0.00025 inch.

4. **Resistance to combustion.**

A. For materials not attached to an oriented strand board or plywood backing, surface-burning characteristics shall be determined according to ASTM E 84-11a, and installed as specified according to ASTM E 2599-11. Values shall not exceed the following:

Flame spread 25
Smoke developed 50

B. For materials attached to an oriented strand board or plywood backing, surface-burning characteristics shall be determined according to ASTM E 84-11a, and shall not exceed the following values:

Flame spread 75
Smoke developed 450

C. Reflective Plastic Core Insulation shall be tested and shall meet the criteria of Section 2613 of the CBC.

5. **Adhesive performance.**

A. **Bleeding .**
The material shall be tested and shall meet the criteria for bleeding as specified in section 6.5.1 of ASTM C 1224-09 or section 7.2.6.1 of ASTM C 1313/C 1313M-10.

B. **Pliability.**
The material shall be tested and shall meet the criteria for pliability as specified in section 6.5.2 of ASTM C 1224-09 or section 7.2.6.2 of ASTM C 1313/C 1313M-10.

6. **Fungi resistance.**
The material shall be tested and shall meet the criteria for fungi resistance as specified in section 6.6 of ASTM C 1224-09 or section 7.2.7 of ASTM C 1313/C 1313M-10.

(h) ~~**Mineral Fiber in Board Form**~~ **SPRAY OR FIELD APPLIED**

This section covers the testing of the spray and field applied forms of materials including, but not limited to, fiber glass, cellulose, mineral fiber, polyisocyanurate, polystyrene, polyurethane, polyimide, phenolic foam and urea formaldehyde foam.

~~1. **Composition.** The basic material shall be made from mineral substances such as rock, slag or glass processed from a molten state into a fibrous form. Insulation shall be composed of mineral fibers with water resistant binder added and formed into flat, rectangular units. Insulation boards shall be uniform in quality, free from defects, such as broken edges, splits or loose materials which would impair its intended use.~~

~~Roof insulation boards shall have either integral waterproofing treatment or a waterproof coating on one surface. The coating shall be flush with the edges of the sides and may be flush with or extend over both ends.~~

1. **General requirements.**

A. For self-supported spray-applied cellulose, the tests shall be performed on a sample with the density determined pursuant to ASTM C 1149-06e1, ''Standard Specification for Self-Supported Spray Applied Cellulosic Thermal Insulation.''

For self-supported, spray-applied cellulose, and stabilized cellulose, the tests shall be done on samples that fully reflect the effect of settling on the product's R-value.

~~2. **Thermal performance.** Determination of the thermal performance shall be in accordance with ANSI/ASTM C 177-76 , ANSI/ASTM C 236-66 , or ANSI/ASTM C 518-76 at the manufacturer's option.~~

~~3. **Resistance to combustion.** Surface-burning characteristics of materials with facings and membranes intended for exposed applications shall be determined according to ANSI/ASTM E 84-79 and shall not exceed the following values:~~

DRAFT

~~Flame spread.....25~~
~~Smoke developed .....450~~

~~Facings and membranes of materials intended for exposed applications shall be exposed to the flame during the ANSI/ASTM E 84-79 test.~~

~~Insulation boards exclusive of facings and membranes shall not exceed the following values:~~

~~Flame spread.....25~~

~~Smoke developed .....50~~

2. **Composition.**

Spray applied cellulose shall be made and manufactured as defined in Section 4 of ASTM C1149-08. The added chemicals shall not create a health hazard. The basic material shall be processed into a form suitable for installation by pneumatic conveying equipment and simultaneous mixing with water and/or adhesive at the spray nozzle.

Spray applied mineral fiber shall be made and manufactured as defined in Section 4 of ASTM C1014-08.

Spray polyurethane foam shall be made and manufactured as defined in Section 6 of ASTM C1029-10. The resulting foam insulated structure shall be free from accumulation of unexpanded material, foreign inclusions, bowing or foam delamination, holes, voids, depressions and objectionable odor throughout the foam, and shall show no excessive variation of thickness and density.

3. **Thermal performance.**

A. Stabilized spray applied cellulose. Determination of the thermal performance shall be in accordance with Section 5.8 of ASTM C 1497-04, using ASTM C 177-10, ASTM C 1363-11, ASTM C 518-10, or ASTM C 1114-06 at the manufacturer's or tester's option.

B. Self-Supported spray applied insulation. Determination of the thermal performance shall be in accordance with Section 4.3 of ASTM C 1149-06e1, using ASTM C 177-10, ASTM C 1363-11, ASTM C 518-10, or ASTM C 1114-06, at the manufacturer's or tester's option.

C. Foam. Determination of the thermal performance shall be in accordance with ASTM C 177-10, ASTM C 1363-11, ASTM C 518-10, or ASTM C 1114-06, at the manufacturer's or tester's option. All foam insulation materials using materials other than air as an expanding agent shall be conditioned prior to R-value testing by one of the following methods:

i. Condition samples at 73.4° ± 2°F and a relative humidity of 50 ± 5 percent for a period of 180 days; or
ii. Condition samples at 140°F ± 2°F dry heat for a period of 90 days.

4**. Resistance to combustion.**

A. Stabilized Spray Applied Cellulose. The material shall be tested and shall meet the criteria for resistance to combustion as specified in Section 5.3 of ASTM C 1497-04, for flammability and Section 5.7 of ASTM C 1497-04, for smoldering combustion.

B. Self-Supported Spray Applied insulation. The material shall be tested and shall meet the criteria for resistance to combustion as specified in Section 4.4 of ASTM 1149-06e1, for flammability and Section 4.6 of ASTM C 1149-08, for smoldering combustion.

C. Spray applied mineral fiber. The material shall be tested and shall meet the criteria for resistance to combustion as specified in Section 9.7 of ASTM C 1014-08.

D. Foam.

i. The material shall be tested and meet the criteria of Sections 2603.1-2603.6 of the CBC.~~, with the additional provision that the surface-burning characteristics shall be determined according to ASTM E 84-11a and shall not exceed the following values:~~

~~Flame spread.....75~~
~~Smoke developed .....450~~

ii. This subsection shall not apply to any product recognized by the International Conference of Building Officials as complying with Sections 2603.1-2603.6 of the CBC based solely upon diversified testing. The manufacturer of any product which is recognized by the International Code Council, as complying with Sections 2603.1-2603.6 of

DRAFT

the CBC based solely upon diversified testing, shall be exempt from this subsection.

5. **Corrosiveness.**

A. For self-supported spray applied cellulose, the material shall be tested and shall meet the criteria for corrosiveness as specified in Section 4.80 of ASTM C 1149-06e1.

B. For stabilized spray applied cellulose, the material shall be tested and shall meet the criteria for corrosiveness as specified in Section 5.2 of ASTM C 1497-04.

C. For spray applied mineral fiber, the material shall be tested and shall meet the criteria for corrosiveness as specified in ASTM C 1014-08, Sec 9.9.

6. **Bond strength.** For self-supported spray applied cellulose, the material shall be tested and shall meet the criteria for bond strength as specified in Section 4.5 of ASTM C 1149-08. This test procedure is not required of products that are installed in such a manner that physical restrictions imposed by the construction elements preclude any possibility of subsequent delamination, erosion, or dusting and the product is identified only for such installations.

7. **Bond deflection.**

A. For self-supported spray applied cellulose, the material shall be tested and shall meet the criteria for bond deflection as specified in Section. 4.12.1 of ASTM C 1149-08.

B. For spray applied mineral fiber, the material shall be tested and shall meet the criteria for bond deflection as specified in Section 9.9 of ASTM C 1014-08.

C. These test procedures are not required of products that are installed in such a manner that physical restrictions imposed by the construction elements preclude any possibility of subsequent delamination, erosion, or dusting and the product is identified only for such installations.

8. **Air erosion.** For self-supported spray applied cellulose, the material shall be tested and shall meet the criteria for air erosion as specified in Section 4.12.2 of ASTM C 1149-08, This test procedure is not required of products which are installed in such a manner that physical restrictions imposed by the construction elements preclude any possibility of subsequent delamination, erosion, or dusting and the product is identified only for such installations.

9. **Odor emission.**

A. For self-supported spray applied cellulose, the material shall be tested and shall meet the criteria for odor emission as specified in Section 4.10 of ASTM C 1149-06e1.

B. For stabilized spray applied cellulose, the material shall be tested and shall meet the criteria for odor emission as specified in Section 5.6 of ASTM C 1497-04.

C. For spray applied mineral fiber, the material shall be tested and shall meet the criteria for odor emission as specified in Section 9.11 of ASTM C 1014-08.

D. For spray applied mineral fiber, the material shall be tested and shall meet the criteria for odor emission as specified in Section 9.8 of ASTM C 1014-08.

10. **Fungi resistance.**

A. For self-supported spray applied cellulose, the material shall be tested and shall meet the criteria for resistance to fungi as specified in Section 4.11 of ASTM C 1149-06e1.

B. For stabilized spray applied cellulose, the material shall be tested and shall meet the criteria for resistance to fungi as specified in Section 5.4 of ASTM C 1497-04.

C. For spray applied mineral fiber, the material shall be tested and shall meet the criteria for resistance to fungi as specified in Section 9.8 of ASTM C 1014-08.

11. **Identification.** Foam containers shall be marked or labeled with the conditions of proper storage.

12. **Water vapor permeance.** Water vapor permeance shall be determined using the Desiccant Method of ASTM E 96/E 96M-10.

13. **Urea formaldehyde foam field applied.**

DRAFT

A. **Composition.** The material shall consist of cellular plastic generated in a continuous stream by mixing the components which are a urea formaldehyde resin, air and a foaming agent. The material shall be suitable for filling closed cavities through small holes and suitable also for filling open cavities by trowelling during foaming prior to enclosure.

B. **Thermal performance.** The effective thermal performance, incorporating a derating value, shall be determined according to the method described in Section 6.2.7 of HUD Bulletin No. 74.

C. **Resistance to combustion.** Surface-burning characteristics shall be determined according to the ASTM E 84-11a and shall not exceed the following values:

Flame spread 25
Smoke developed 450

Test specimens shall be aged for 45 days at 70°F ± 5°F and 35 to 40 percent relative humidity before testing.

D. **Emissions.** Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.1 (2010) http://www.cal-iaq.org/phocadownload/cdph-iaq_standardmethod_v1_1_2010%20new1110.pdf.

E. **Corrosiveness.** The material shall be tested and shall meet the criteria for corrosiveness as specified in Section 6.2.8 of HUD Bulletin No. 74.

F. **Density.** The material shall be tested and shall meet the criteria for density as specified in Section 6.1.4 of HUD Bulletin No. 74.

G. **Shrinkage.** The material shall be tested and meet the criteria for shrinkage as specified in Section 6.2.5 of HUD Bulletin No. 74, except that the material shall not shrink more than 2.0 percent in any direction.

H. **Volume resistivity.** The material shall be tested and meet the criteria for volume resistivity as specified in Section 6.2.3 of HUD Bulletin No. 74.

I. **Identification.** Resin and foaming agent containers shall be marked with conditions of proper storage and the derated R-value and shrinkage of the prepared foam as certified by the manufacturer.

(i) ~~**Mineral Fiber in Loose Fill Form.**~~ **STRUCTURAL PANELS AND SHEATHING**

This section covers the testing of the panel form of materials including, but not limited to, structurally insulated panels, insulated metal panels, insulated concrete forms and structural insulated sheathing.

~~1. **Composition.** Mineral fiber insulation shall be made from mineral substances such as rock, slag or glass processed from a molten state into fibrous form. The insulation shall be mechanically processed to produce a mineral fiber suitable for pneumatic or poured application.~~

~~2. **Thermal performance.** Determination of the thermal performance shall be in accordance with ANSI/ASTM C 177-76 , ANSI/ASTM C 236-66, or ANSI/ASTM C 518-76 at the manufacturer's option.~~

~~3. **Density.** The density shall be determined according to installed design density. All tests shall be conducted at the installed design density.~~

~~4. **Resistance to combustion.** Loose fill insulation shall comply with the United States General Services Administration insulation standard HH-I-1030B dated August 12, 1980, for flammability and smoldering combustion testing.~~

~~5. **Corrosiveness.** Corrosiveness shall be determined according to Test Description Number 2. The steel plate in contact with the insulation shall show no greater corrosion than a steel plate in contact with sterile cotton.~~

~~6. **Resistance to fungi.** Resistance to fungi shall be determined according to Method 508 of the March 10, 1975, edition of the Military Standard for Environmental Test Methods known as MIL-STD-810C, except the spore suspensions shall be prepared using distilled water. The core of gypsum wall board shall be used as the control. After the test exposure, the test samples shall show no more fungal growth than the control material when examined at 40 times magnification.~~

~~7. **Odor emission.** Odor emission shall be determined according to Test Description Number 1. A detectable odor of objectionable nature observed by two or more of the panel members shall be cause for rejection.~~

~~8. **Identification.** Each insulation container shall be marked with the type (pouring or pneumatic), the net weight and the~~

DRAFT

~~manufacturer's recommendations for installation including minimum thickness, maximum coverage and installed design density to provide the levels of thermal performance shown. Manufacturer's installation recommendations shall include precautions according to the *California Electrical Code* Section 410-66.~~

~~Products which may be used for pressure fill retrofit wall application shall be marked with the recommended wall density to prevent settling and separately marked with the tested thermal performance for such applications.~~

1. **Thermal performance.**

For structural insulated panels (SIPS), structural insulated sheathing (SIS) and Insulated metal panels having the construction described above, determination of the thermal performance shall be in accordance with ASTM C 177-10, ASTM C 1363-11, ASTM C 518-10, or ASTM C 1114-06, at the manufacturer's or tester's option.

If the panel is of a different construction than specified in Appendix 4 of Title 24, Part 6, the overall U-factor shall be determined using ASTM C 1363-11. The sample shall be assembled with screws and other fasteners used in practice or installation.

2. **Resistance to combustion.**

Surface-burning characteristics of panel insulation shall be determined according to ASTM E 84-11a and shall not exceed the following values:

Flame spread	25
Smoke developed	450

(j) ~~**Perlite in Loose Fill Form.** .~~ **TUBULAR INSULATION**

This section covers the testing of the tubular (pipe) form of materials including, but not limited to, fiber glass, mineral fiber, ceramic fiber, polyimide, calcium silicate, elastomeric (rubber), melamine foam, molded expanded perlite, extruded polystyrene (fabricated from billets), and polyisocyanurate (fabricated from billets).

All pipe insulation and pipe coverings in plenums shall comply with the CMC.

~~1. .**Composition.** Expanded perlite loose fill insulation shall be produced by the expanding of natural perlite or by heating.~~

~~2. **Thermal performance.** Determination of the thermal performance shall be in accordance with ANSI/ASTM C 177-76 , ANSI/ASTM C 236-66, or ANSI/ASTM C 518-76 at the manufacturer's option.~~

~~3. **Density.** Density shall be determined according to installed design density. All tests except the ANSI/ASTM E 84-79 test shall be conducted at the installed design density.~~

~~4. **Resistance to combustion.** Resistance to combustion shall be determined by the use of the Attic Floor Radiant Panel Test, as described in the United States General Services Administration insulation standard HH-I-515D Section 3.1.9 as amended October 11, 1979.~~

~~5. **Identification.** Each insulation container shall be marked with the type (pouring or pneumatic), the net weight and the manufacturer's recommendations for installation including minimum thickness, maximum coverage and installed design density to provide the levels of thermal performance shown. Manufacturer's installation recommendations shall include precautions according to the 1993 *National Electrical Code* Section 410-66.~~

~~Products which may be used for pressure fill retrofit wall application shall be marked with the recommended wall density to prevent settling and separately marked with the tested thermal performance for such applications.~~

1 .**Composition.**

Calcium silicate pipe insulation shall be made and manufactured as defined in Section 5 of ASTM C533-09. Asbestos shall not be used as an ingredient or component.

Cellular glass pipe shall be made and manufactured as defined in Section 6 of ASTM C552-07 and fabricated according to ASTM C 1639-10a.

Cellular polyolefin tubular form shall be made and manufactured as defined in Section 5 of ASTM C1427-07

Elastomeric tubular form shall be made and manufactured as defined in Section 5 of ASTM C534/C534M-08.

Melamine foam pipe insulation shall be made and manufactured as defined in ASTM C1410-05aE1.

DRAFT

Mineral fiber pipe (rock, slag, glass) shall be made and manufactured as defined in Section 5 of ASTM C547-07 or Section 6 of ASTM C592-08a or Section 6 of ASTM C1393-08. Asbestos shall not be used as an ingredient or component.

Molded expanded perlite pipe insulation shall be made and manufactured as defined in ASTM C610-09.

Phenolic pipe insulation shall be made and manufactured as defined in Section 6 of ASTM C1126-04.

Polyimide board shall be made and manufactured as defined in Section 5 of ASTM C1482-09 or Section 5 of ASTM C1594-07. The theoretical mole fraction of imide bonds must be greater than the theoretical mole fraction of amide bonds.

Polyisocyanurate shall be made and manufactured as defined in Section 6 of ASTM C591-09.

Polystyrene pipe insulation shall be made and manufactured as defined in Section 6 of ASTM C578-10.

2. **Thermal performance.**

Insulation thermal conductivity shall be determined in accordance with ASTM C 335**/**C 335M-10e1, ASTM C 177-10, ASTM C 1363-11, ASTM C 518-10, or ASTM C 1114-06, at the manufacturer's or tester's option. Insulation thermal conductivity shall be determined at the mean temperatures of 75°F for temperatures below 105°F, 100°F for temperatures between 105°F and 201°F and 150 °F for temperatures between 201°F and 250°F. Thermal conductivity shall be rounded to the nearest 1/100 Btu-inch per hour per square foot per °F.

3. **Resistance to combustion**

A. Surface-burning characteristics of pipe insulation shall be determined according to ASTM E 84-11a and installed as specified according to ASTM E 2231-09 and shall not exceed the following values:

Flame spread ..... 2~~7~~5
Smoke developed 450

B. If installed inside an air plenum, the surface-burning characteristics of pipe insulation shall not exceed the following values:

Flame spread..... 25
Smoke developed 50

4**.** **Size.** The thickness shall be determined according to ASTM C 302-95 (reapproved 2007).

5. **Water vapor sorption**. Water vapor sorption of mineral fiber or open-cell insulation shall be determined according to ASTM C 1104/C 1104M-00 (reapproved 2006). Water absorption of closed cell foam insulation products shall be determined according to ASTM C 272-01(2007**)**, Procedure A.

6. **Water vapor permeance.** Water vapor permeance shall be determined using the Desiccant Method of ASTM E 96/E 96M-10.

(k) ~~**Polystyrene in Board Form**~~ **VACUUM PANEL**

This section covers the testing of vacuum panel form of materials including, but not limited to, panels with an evacuated core.

~~1. **Composition.** Insulation board shall be formed by the expansion of polystyrene resin beads or granules in a mold or the insulation board shall be formed by the expansion of polystyrene base resin in an extrusion process. The insulation shall be uniformly fused, homogeneous, and essentially unicellular. Insulation board shall be uniform in physical properties and reasonably free of voids or accumulations of unexpanded material, foreign inclusions, broken corners and broken edges.~~

~~2. **Thermal performance.** Determination of the thermal performance shall be in accordance with ANSI/ASTM C 177-76, ANSI/ASTM C 236-66, or ANSI/ASTM C 518-76 at the manufacturer's option. All foam insulation materials using materials other than air or pentane as an expanding agent shall either separately condition samples at 73.4 ° ± 3.6°F and a relative humidity of 50 ±5 percent, and at 140°F dry heat and test at 30-, 60- and 90-day intervals or shall test samples certified by an approved testing laboratory to have been aged while exposed to free air in a well ventilated room for at least two years at 70° ± 10°F, provided, however, that until 2 1/2 years after the adoption of these quality standards by the Commission, test samples may be aged for six months for certification of the material.~~

DRAFT

~~Notwithstanding any other provision of this article, this thermal performance standard shall not take effect until 250 days after adoption. If the certification statement submitted pursuant to Section 1555 of this article does not include test results for thermal performance, the manufacturer shall submit a new certification statement which includes such test results prior to 250 days after adoption. If the latest certification statement is based on the six-month aging test, a new statement, based upon the two-year aging test or the accelerated aging test shall be submitted by 2 1/2 years after the adoption date.~~

~~3. A. **Resistance to combustion.** The material shall be tested to meet the requirements of Sections 2602.1-2602.6 of the 1994 *Uniform Building Code*, with the additional provision that the surface-burning characteristics shall be determined according to ANSI/ASTM E 84-79 and shall not exceed the following values:~~

~~Flame spread ..... 75~~
~~Smoke developed ..... 450~~

~~B. This subsection shall not apply to any product recognized by the International Conference of Building Officials, as of the date of adoption of these regulations, as complying with Sections 2602.1-2602.6 of the 1994 *Uniform Building Code* based solely upon diversified testing. The manufacturer of any product which is recognized by the International Conference of Building Officials, subsequent to the date of approval of these regulations, as complying with Sections 2602.1-2602.6 of the 1994 *Uniform Building Code* based solely upon diversified testing, may petition the Commission for an exemption, of that product from the provisions of this subsection.~~

~~4. **Dimensional stability.** All foamed polystyrene insulation materials which are factory formed shall be tested for dimensional stability in accordance with Procedures E and G of ASTM D 2126-75 with the following exceptions: (a) sample size shall be 12 inches by 12 inches ± 1 inch, and (b) samples shall be tested as manufactured with or without facers~~

~~The average percent change in length or width shall not exceed ± 2 percent in 24 hours or ± 4 percent in seven days. The average percent change in thickness shall not exceed ± 10 percent in seven days. Samples shall be regarded as failing if: (1) delamination area of "faced" samples exceeds 25 percent or (2) warping or cupping exceeds 1/4 inch when checked by a straight edge across raised diagonal corners.~~

1. **Composition.** The vacuum panel shall meet all specifications described in ASTM C 1484-10.

2. **Thermal performance.**

Determination of the thermal performance shall be in accordance with ASTM C 1484-10, Sec. 11.4, using ASTM C 177-10 or ASTM C 518-10, at the manufacturer's or tester's option.

3. **Resistance to combustion.**

The vacuum panel shall meet the CBC flammability resistance tests and criteria required for the end use of the product.

~~(l) Polyurethane and polyisocyanurate in board form and field applied.~~

~~1. **Composition.** The manufacture of the insulation shall be based mainly on the reaction of an organic polyisocyanate with a polyol resin.~~
~~Board shall be of uniform texture, reasonably free from accumulation of unexpanded material and foreign inclusions, and reasonably free of broken edges and corners. It shall be reasonably free from holes, voids, depressions and objectionable odor. Laminated composite boards shall be included in this quality standard. The faces of laminated boards shall adhere firmly throughout to the foam, and shall show no excessive amounts of slits, voids or depressions.~~
~~2. **Thermal performance.** Determination of the thermal performance shall be in accordance with ANSI/ASTM C 177-76, ANSI/ASTM C 236-66, or ANSI/ASTM C 518-76 at the manufacturer's option. All foam insulation materials using materials other than air or pentane as an expanding agent shall either separately condition samples at 73.4° ± 3.6°F and a relative humidity of 50 ± 5 percent, and at 140°F dry heat and test at 30-, 60- and 90-day intervals or shall test samples certified by an approved testing laboratory to have been aged while exposed to free air in a well ventilated room for at least two years at 70° ± 10°F, provided, however, that until 2 1/2 years after the adoption of these quality standards by the Commission, test samples may be aged for six months for certification of the material.~~

~~Notwithstanding any other provision of this article, this thermal performance standard shall not take effect until 250 days after adoption. If the certification statement submitted pursuant to Section 1555 of these regulations does not include test results for thermal performance, the manufacturer shall submit a new certification statement which includes such test results prior to 250 days after adoption. If the latest certification statement is based on the six-month aging test, a new statement, based upon the two-year aging test or the accelerated aging test shall be submitted by 2 1/2 years after the adoption date.~~
~~3. **Dimensional stability.** All foamed polyurethane and polyisocyanurate insulation materials which are factory formed shall be tested for dimensional stability in accordance with Procedures E and G of ASTM D 2126-75 with the following exceptions: (a) sample size shall be 12 inches by 12 inches ± 1 inch and (b) samples shall be tested as manufactured with or without facers.~~

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The average percent change in length or width shall not exceed ±2 percent in 24 hours or ± 4 percent in seven days. The average percent change in thickness shall not exceed ± 10 percent in seven days. Samples shall be regarded as failing if: (1) delamination area of "faced" samples exceeds 25 percent or (2) warping or cupping exceeds 1/4 inch when checked by a straight edge across raised diagonal corners.

4. **Resistance to combustion.**

A. The material shall be tested to meet the requirements of Sections 2602.1-2602.6 of the 1994 *Uniform Building Code*, with the additional provision that the surface-burning characteristics shall be determined according to ANSI/ASTM E 84-79 and shall not exceed the following values:

Flame spread.....75
Smoke developed 450

B. This subsection shall not apply to any product recognized by the International Conference of Building Officials, as of the date of adoption of this article, as complying with Sections 2602.1-2602.6 of the 1994 *Uniform Building Code* based solely upon diversified testing. The manufacturer of any product which is recognized by the International Conference of Building Officials, subsequent to the date of approval of these regulations, as complying with Sections 2602.1-2602.6 of the 1994 *Uniform Building Code* based solely upon diversified testing, may petition the Commission for an exemption of that product from the provisions of this subsection.

5. **Identification.** Foam containers shall state the conditions of proper storage.

(m) **Urea Formaldehyde Foam Field Applied.**

1. **Limitation on sale.** Urea formaldehyde foam is unsafe for use as insulation. Sale within the State of California of urea formaldehyde foam insulation is prohibited.

2. **Exemption.** Notwithstanding any other provision of this article, a manufacturer of the primary components of urea formaldehyde foam insulation may apply for certification as provided in Section 1555 of this article. Such certification statement shall indicate compliance with the following standards:

A. **Composition.** The material shall consist of cellular plastic generated in a continuous stream by mixing the components which are a urea formaldehyde resin, air and a foaming agent. The material shall be suitable for filling closed cavities through small holes and suitable also for filling open cavities by trowelling during foaming prior to enclosure.

B. **Thermal performance.** The effective thermal performance, incorporating a derating value, shall be determined according to the method described in 42 Fed. Reg. pages 55143-55148.

C. **Resistance to combustion.** Surface-burning characteristics shall be determined according to the ANSI/ASTM E 84-79 and shall not exceed the following values:

Flame spread.....25
Smoke developed 450

Test specimens shall be aged for 45 days at 70°F ± 5°F and 35 to 40 percent relative humidity before testing.

D. **Free formaldehyde content of dry foam.** The free formaldehyde content of the dry foam shall be less than 0.01 percent formaldehyde by weight when tested as specified in paragraph (f) (8), published in 45 Fed. Reg. page 63801, except that the specimens to be tested shall also be aged for 56 days at 24 ± 5°C (75 ± 10°F) and 50 ± 10 percent relative humidity in an uncovered beaker.

E. **Corrosiveness.** The material shall be tested and shall meet the criteria for corrosiveness as specified in 45 Fed. Reg. pages 63786-63810.

F. **Density.** The material shall be tested and shall meet the criteria for density as specified in 45 Fed. Reg. pages 63786-63810.

G. **Shrinkage.** The material shall be tested and meet the criteria for shrinkage as specified in 45 Fed. Reg. pages 63786-63810, except that the material shall not shrink more than 2.0 percent in any direction.

H. **Volume resistivity.** The material shall be tested and meet the criteria for volume resistivity as specified in 45 Fed. Reg. pages 63786-63810.

I. **Identification.** Resin and foaming agent containers shall be marked with conditions of proper storage and the derated *R*-value and shrinkage of the prepared foam as certified by the manufacturer.

J. **Safety information.** Installers of urea formaldehyde foam insulation shall present the following safety notice to the purchasers of the foam prior to the signing of the contract for installation. The notice shall be printed in a minimum of 8-point type size. One copy of the notice signed by the purchaser shall be immediately given to the purchaser, one copy shall be retained by the installer and one copy shall be mailed by the installer to the Executive Director of the Energy Commission within 48 hours after installation of the insulation is completed.

Manufacturers shall make all sales of urea foam insulation components expressly subject to the application restrictions listed in the notice described below.

DRAFT

UREA FORMALDEHYDE FOAM INSULATION SAFETY NOTICE

The Federal Panel on Formaldehyde has concluded that formaldehyde should be presumed to pose a carcinogenic (cancer) risk for humans, Formaldehyde gas may also cause eye, nose, and throat irritation, coughing, shortness of breath, skin irritation, nausea, headaches, and dizziness. People with respiratory problems or allergies may suffer more serious reactions, especially people allergic to formaldehyde. Women who are pregnant or planning to become pregnant should not be exposed to this product.
The symptoms may appear immediately or not until months after installation.
This product may release formaldehyde gas into your home or building over a long period of time. In some instances the formaldehyde gas cannot be controlled by ventilation or other means.

Application of this product is restricted to exterior sidewalls in both residential and commercial/industrial buildings. A 4-mil thickness plastic polyethylene vapor barrier, or equivalent plastic sheeting vapor barrier, shall be installed between the urea formaldehyde foam insulation and the interior space of the home or building in all applications.
If you have health concerns, call your doctor. Also, call the installer or manufacturer of the material.

(PLEASE PRINT OR WRITE LEGIBLY)

PURCHASER NAME OR NAMES _____

PURCHASER ADDRESS _____ CITY _____ ZIP _____

PURCHASER PHONE NUMBER: Home (____) _____ Work (____) _____

a) LOCATION OF INSTALLATION IF DIFFERENT FROM ABOVE

LOCATION ADDRESS _____ CITY _____ ZIP _____

The purchaser acknowledges he or she has read and understand this notice.

Signed X _____ Date _____

Signed X _____ Date _____

B. THE FOLLOWING INFORMATION IS TO BE COMPLETED BY THE INSTALLING CONTRACTOR

CONTRACTOR'S NAME _____

CONTRACTOR'S ADDRESS _____ CITY _____ ZIP _____

CONTRACTOR'S STATE LICENSE NUMBER _____

NAME OF MANUFACTURER _____

MANUFACTURER'S ADDRESS _____ CITY _____ ZIP _____

MANUFACTURER'S PHONE NUMBER (____) _____

TEMPERATURE OF OUTSIDE AIR AT START OF INSTALLATION _____ °F

	BATCH NUMBER	**EXPIRATION DATE**	**TEMPERATURE (START OF INSTALLATION)**
RESIN			°F
FOAMING AGENT			°F

DRAFT

STEPS THE INSTALLING CONTRACTOR MUST FOLLOW

1. The installing contractor is responsible for mailing this completed notice to the following address within 48 hours after completion of installation. Mail copy to:
   Executive Director
   Energy Resources, Conservation and Development Commission
   1516 9th Street
   Sacramento, CA 95814

2. Give one copy to the Purchaser.

3. The installing contractor shall keep one copy of this completed notice for a period of not less than three years.

3. **Severability of Provisions.** If any provision of Section 1553 (m) (1) or (2), or the application thereof to any person or circumstances, is held invalid, the remaining provisions, or the application of such provisions to other persons or circumstances, shall not be affected thereby.

(n) **Vermiculite in Loose Fill Form.**

1. **Composition**. Vermiculite loose fill insulation shall be produced by the expanding or exfoliating of natural vermiculate or by grading and heating.

2. **Thermal performance.** Determination of the thermal performance shall be in accordance with ANSI/ASTM C 177-76 , ANSI/ASTM C 236-66, or ANSI/ASTM C 615-76 at the manufacturer's option.

3. **Density.** Density shall be determined according to installed design density. All tests except the ANSI/ASTM E 84-79 test shall be conducted at the installed design density.

4. **Resistance to combustion.** Resistance to combustion shall be determined by the use of the Attic Floor Radiant Panel Test, as described in the United States General Services Administration insulation standard HH-I-515D as amended October 11, 1979.

5. **Identification.** Containers of vermiculite shall be marked with the type (pouring or pneumatic), the net weight and the manufacturer's recommendations for installation including minimum thickness, maximum coverage and installed design density to provide the levels of thermal performance shown. Manufacturer's installation recommendations shall include precautions according to the *California Electric Code* Section 410-66.

Products which may be used for pressure fill retrofit wall application shall be marked with the recommended wall density to prevent settling and separately marked with the tested thermal performance for such applications.

Authority cited: Sections 25402(a) and 25920, Public Resources Code.19034 and 19164, Business and Professions Code.
Reference: Sections 25920-25922, Public Resources Code. 19018, 19019, 19020, 19021, 19022, 19034, 19164, and 19165, Business and Professions Code.

Approval of Testing Laboratories

Sec. 12-13-1554.

(a) Except as provided in subsection (b), laboratories shall be approved using the procedures described in the Criteria for the Approval of Testing Laboratories, dated October 27, 1978. The Executive Director shall approve any laboratory that meets the standards described in the Criteria for the Approval of Testing Laboratories, dated October 27, 1978. A testing laboratory shall have the right to appeal to the full Commission any denial of approval by the Executive Director.

(b) Up to and including September 30, 1982, laboratories shall be approved either upon accreditation by the United States Department of Commerce National Voluntary Laboratory Accreditation Program or as stated in the preceding paragraph, at the manufacturer's option. After September 30, 1982, Laboratories shall only be deemed approved by the Bureau upon accreditation by the United States Department of Commerce National Voluntary Laboratory Accreditation Program and its MRA signatories.

Authority cited: Section 25218(e), Public Resources Code. 19034, Business and Professions Code.
Reference: Sections 25915(a) and 25921, Public Resources Code.19018, 19021 and 19165, Business and Professions Code.

Certification

Sec. 12.13-1555.

(a) No insulating material shall be sold or installed in California on or after September 22, 1981, unless the manufacturer has certified that the material complies with the provisions of this article.
(b) The manufacturer shall submit a certification statement to the Executive Director Bureau for each type of insulating material. Such statement shall contain the following information:

1. Name of the manufacturer.

DRAFT

2. A description of the type of insulating material being certified in sufficient detail to permit its identification. The description may include information sheets, brochures, a sample label for the product or similar information.

3. Test results from an approved laboratory.

4. A description of the basis for ensuring that all the insulating material of the type being certified complies with the requirements of this article. Such description shall include, but not be limited to, a description of the frequency of testing of the material, the quality assurance program, and any third-party inspections or testing used by the manufacturer.
5. A declaration that the insulating material complies with the requirements of this article.

6. The wording of the certification seal, if such seal consists of a statement pursuant to Section 12-13-1557 (b) (2) of this article.

(c) Every certification statement shall be dated and signed by the manufacturer attesting to its truth and accuracy. Where the manufacturer is either a corporation or a business association, the certification statement shall be dated, signed and attested to by a ~~responsible official thereof.~~ representative with authority to do so.

~~(d) Within 45 days after receipt of a certification statement, the Executive Director shall forward, to the manufacturer, an acknowledgment that the statement has been received and that it is complete and accurate on its face.~~

~~(e) Certification of the insulation material shall be deemed to occur upon forwarding of the acknowledgement by the Executive Director. If acknowledgment is not forwarded in a timely manner, certification shall be deemed to occur on the 45th day after receipt of the certification statement.~~

~~(f) The statement of test results required in the certification may be based upon tests conducted prior to the adoptive date of this article if: (1) the same test was conducted within two years of the date of adoption, (2) the laboratory at which the tests were conducted has been approved for those tests as of the date of the certification statement, and (3) the laboratory certifies that the test and product are the same as the test and product referred to in the statement of test results.~~

Authority cited: Sections ~~25218(e), Public Resources Code~~ 19034 and 19164, Business and Professions Code.
Reference: Sections ~~25921 and 25921.1, Public Resources Code.~~ 19018, 19021, 19022,19164 and 19165, Business and Professions Code.

Quality Assurance. (Reserved)

Sec. 12-13-1556.

Identification

Sec. 12-13-1557.

(a) Except as specified in subsection (b), Item ~~23~~2, of this section, no insulation shall be sold or installed in California ~~on or after September 22, 1981,~~ unless the insulating material, container, bundle or similar packaging material, bears a visible ~~Commission~~ Bureau approved statement certifying that a representative sample of the insulation material has been tested and approved by an approved laboratory and complies with the requirements of this article.
(b) The ~~Commission~~ Bureau approved statement shall consist of either:

1. A design or statement approved by the ~~Executive Director~~ Bureau,

   or

2. An identification of the manufacturer and ~~any~~ a statement that the material meets the quality standards of the State of California. A statement that the material meets the quality standards of the State of California included in a bill of lading shall fulfill the requirements of this section only if either the product is being shipped in bulk, or the container or product is not otherwise labeled by the manufacturer and the product is being sold to its ultimate user.

~~3. A statement that the material meets the quality standards of the State of California included in the bill of lading shall meet the requirements of this section only if the product is being shipped in bulk, or the container or product is not otherwise labeled by the manufacturer and the product is being sold to its ultimate user.~~

(c) Any representation of thermal performance which appears on any label, literature, advertising or any other writing intended for the public shall be consistent with the certification testing results and derating required by this article.

(d) Any insulation with facings and membranes for which the flame spread exceeds 25 when tested with facings and membranes exposed to the flame during the ~~ANSI/~~ASTM E 84-~~79~~11a test must be clearly labeled with a statement that the product may be highly combustible if used in an exposed application. This subsection shall not apply to any product meeting the requirements of Sections 2602.1-2602.6 of the ~~1994 *Uniform Building Code*~~ CBC.

DRAFT

Authority cited: Section ~~25218(e), Public Resources Code~~. 19034, Business and Professions Code
Reference: Sections ~~25921, Public Resources Code.~~ 19164 and 19165, Business and Professions Code.

General Labeling Requirements

Sec. 12-13-1557.10

All insulation and radiant barriers tested and certified by the Bureau shall have a label or mark of the tested thermal performance or thermal emittance, as appropriate, on the installed insulation and packages of insulation and radiant barriers.

The label for all insulation and radiant barrier packages of insulation must contain, at a minimum, the following:

(1) The type of insulation.
(2) The registry number assigned or approved by the Bureau.
(3) The product identification code as given to the Bureau for use in the Directory of Certified Insulation Materials.
(4) All of the disclosures required by Section 460.12 of Title 16 of the Code of Federal Regulations.
(5) The tested thermal performance or thermal emittance, as appropriate.

Authority cited: Section 19034, Business and Professions Code.
Reference: Sections 19164 and 19165, Business and Professions Code.
Inspections

Sec. 12-13-1558.

~~After September 22, 1981, t~~The ~~Commission~~ Bureau may~~, upon the consent of the owner or lessee, or upon securing a search warrant,~~ have access to and inspect, during normal working hours, ~~to~~ the premises of manufacturers, distributors and retailers of insulating material sold for installation within the state for the purpose of determining compliance ~~with the standards promulgated pursuant to Chapter 10.5 of the *California Public Resources Code*.~~ with the Home Furnishings and Thermal Insulation Act and any regulations adopted thereto. Such access shall be for the purposes of obtaining representative samples of subject insulation and inspecting records and documents pertaining to tests by approved testing labs.

Authority cited: Sections ~~25218 (e), Public Resources Code~~. 19004.1, 19031, 19034, 19164 and 19200, Business and Professions Code.
Reference: Sections ~~25926, Public Resources Code~~. 19164 and 19200.5, Business and Professions Code.

Performance Tests

Sec. 12-13-1559.

The ~~Commission~~ Bureau may conduct, or may contract with others to conduct, independent performance tests of representative samples of insulation sold in the state to determine compliance with ~~standards adopted pursuant to Chapter 10.5 of the *California Public Resources Code*~~, the Home Furnishings and Thermal Insulation Act and any regulations adopted thereto. Such tests shall form the basis for instituting enforcement proceedings.

Authority cited: Sections ~~25218 (e), Public Resources Code~~ 19034, 19164 and 19200, Business and Professions Code.
Reference: Sections 19164, 19165, 19200.5 and 19213, Business and Professions Code ~~25926, Public Resources Code~~.

Costs of Inspection and Testing~~. (Reserved)~~

Sec. 12-13-1560.

The Bureau may require manufacturers, distributors, or retailers that are inspected and found not in compliance with this article to pay fees to cover the costs of inspections and testing necessary to investigate and enforce compliance. These fees shall be fixed to a minimum of $200.00 and a maximum of $500.00 per inspection.

Authority cited: Sections ~~25218 (e), Public Resources Code~~ 19034, 19164, 19165 and 19213, Business and Professions Code,
Reference: Sections ~~25926, Public Resources Code~~19200.5, 19213, Business and Professions Code.

DRAFT

Enforcement~~. (Reserved)~~

Sec. 12-13-1561.

(a) Failure to comply with any provisions of this chapter shall constitute grounds for discipline pursuant to Section 19210 of the Business and Professions Code.

(b) The Bureau chief or his or her designee may issue an order requiring the manufacturer to withhold from sale or destroy, statewide, any article or articles found to be in violation of this article.

Authority cited: Sections 19034, Business and Professions Code.
Reference: Sections 19004.1, 19202, 19203, 19204, 19208, 19209, 19210 19212, and 19213 Business and Professions Code.

Citations

Sec. 12-13-1561.10

The chief of the Bureau is authorized to determine when and against whom a citation will be issued and to issue citations containing orders of abatement, fines, or both, for violations of this chapter. The citations that contain fines shall not exceed two thousand five hundred dollars ($2,500) for each violation. Each citation shall be in writing and shall describe with particularity the nature and facts of each violation, including a reference to the statute(s) or regulation(s) alleged to have been violated. The citation shall inform the cited person of the right to contest the citation, that hearing shall be requested by written notice to the Bureau within 30 days of the issuance of the citation. The citation shall be served upon the cited person personally or by certified mail.

Authority cited: Sections 125.9 and 19034, Business and Professions Code.
Reference: Sections 19208, 19209, 19210, 19212 and 19214, Business and Professions Code.

Citation Factors

Sec. 12-13-1561.20

In assessing an administrative fine or issuing an order of abatement, the Chief shall consider the following factors:

(a) The nature and severity of the violation.

(b) The good or bad faith exhibited by the cited person.

(c) The history of previous violations of the same or similar nature.

(d) Evidence that the violation was or was not willful.

(e) The extent to which the cited person has cooperated with the Bureau's investigation.

(f) The extent to which the cited person has mitigated or attempted to mitigate any damage or injury caused by the violation.

(g) Any other factors as justice may require.

Authority cited: Sections 125.9 and 19034, Business and Professions Code.
Reference: Sections 19208, 19209, 19210 and 19212, Business and Professions Code.

Compliance with Citation / Order of Abatement

Sec. 12-13-1561.30

(a) If a cited person who has been issued an order of abatement is unable to complete the correction within the time set forth in the citation because of conditions beyond his or her control after the exercise of reasonable diligence, the cited person may request an extension of time in which to complete the correction from the Bureau chief. Such a request shall be in writing and shall be made within the time set forth for abatement.

DRAFT

(b) If a citation is not contested, or if the citation is contested and the cited person does not prevail, failure to abate the violation or to pay the assessed fine within the time allowed shall constitute a violation and a failure to comply with the citation or order of abatement.

(c) Failure to timely comply with an order of abatement or pay an assessed fine may result in disciplinary action being taken by the Bureau or other appropriate judicial action being taken against the cited person.

Authority cited: Sections 125.9 and 19034, Business and Professions Code.
Reference: Sections 19208, 19209, 19210, 19212 and 19214, Business and Professions Code.

Contested Citations and Request for a Hearing or Informal Citation Conference

Sec. 12-13-1561.40

(a) If a cited person wishes to contest the citation, assessment of the administrative fine, or order of abatement, the cited person shall, within thirty (30) days after service of the citation, file in writing a request for an administrative hearing to the Bureau chief regarding the acts charged in the citation.

(b) In addition to or instead of requesting an administrative hearing, the cited person may, within 30 days after service of the citation, contest the citation by submitting a written request for an informal citation conference to the bureau chief or his/her designee.

(c) Upon receipt of a written request for an informal citation conference, the bureau chief or his/her designee shall, within 30 days, hold an informal citation conference with the cited person. The cited person may be accompanied and represented at the informal citation conference by an attorney or other authorized representative.

(d) If an informal citation conference is held, the request for an administrative hearing shall be deemed to be withdrawn and the bureau chief or his/her designee may affirm, modify or dismiss the citation, including any fine levied or order of abatement issued, at the conclusion of the informal citation conference. If affirmed or modified, the citation originally issued shall be considered withdrawn and an affirmed or modified citation, including reasons for the decision, shall be issued. The affirmed or modified citation shall be mailed to the cited person and his/her counsel, if any, within 10 days from the date of the informal citation conference.

(e) If a cited person wishes to contest an affirmed or modified citation, the cited person shall, within 30 days after service of the citation, contest the affirmed or modified citation by submitting a written request for an administrative hearing, to the Bureau chief or his or her designee. An informal citation conference shall not be held on affirmed or modified citations.

Authority cited: Sections ~~25218 (e), Public Resources Code.~~125.9, 19034, 19164 and 19214, Business and Professions Code.
Reference: Sections ~~25931, Public Resources Code 25931, Public Resources Code~~ 19208, 19209, 19210 and 19214, Business and Professions Code.

~~**Release of Information**~~

~~**Sec. 12-13-1562.**~~

~~Persons submitting information to the Commission who wish information to be kept confidential shall comply with the provisions of Sections 2501-2511 of the Public Resources Code.~~

~~**Authority cited:** Section 25218(e), Public Resources Code.~~
~~**Reference:** Sections 25223 and 25921.1, Public Resources Code.~~
~~**Liability**~~

~~**Sec. 12-13-1563.**~~

~~Nothing in this article shall be construed as imposing responsibility on manufacturers for misuse of properly labeled insulation.~~

~~**Authority cited**: Section 25218(e), Public Resources Code.~~
Reference: ~~**Sections 25926 and 25931, Public Resources Code.**~~

~~Insulating Existing Buildings~~
~~See. 12-13-1564.~~
~~(a) On or after March 25. 1982, if insulating material is installed in an existing building, in any of the applications specified in California Code of Regulations, Title 24, Part 6, Section 118, the installing contractor shall certify that the amount of insulation~~

DRAFT

~~installed meets or exceeds the requirements of Part 6, Section 118 for that application. Such certification shall be made on completion of the installation by posting in a conspicuous location a certificate signed under penalty of perjury. The certificate shall state the manufacturer's name and material identification, the thermal resistance (*R*-value) of the newly installed insulation, the estimated *R* value of the original insulation, the total *R* value, and (in application of loose fill insulation) the minimum contractor installed weight per square foot. This installed weight per square foot shall conform with the manufacturer's installed design density per square foot at the manufacturer's labeled *R* value.~~

~~(b) Water Heater Insulation Kits. No water heater insulation kit shall be sold, on or after March 25, 1982, unless it has a thermal resistance of at least R-6 and is so identified.~~

~~Each water heater insulation kit sold shall include instructions which are equivalent to the Department of Energy standard practice for the installation of insulation on gas-fired, oil-fired and electric resistance water heaters, 44 Fed. Reg. pages 64703-64705. .~~

~~Authority cited: Section 2S9Z2, Public Resources Code.~~
~~Reference: Section 25922, Public Resources Code.~~

~~Interpretation~~

~~Sec. 12-13-1565.~~

~~The General Counsel of the Commission shall make a determination as to the application or interpretation of any provision of this article to any person requesting such a determination. Any such request shall be submitted in writing to the Commission. The Commission shall make written replies to such inquiries and shall widely publish interpretations that have broad application or interest.~~

~~Authority cited: Section 25218 (e), Public Resources Code.~~
~~Reference: Section s 25920 and 25922, Public Resources Code.~~

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